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UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Science Research Division
Vegetables and Ornamentals Research Branch
Potato Investigations
Beltsville, Maryland

THE NATIONAL POTATO-BREEDING PROGRAM, 1971

By
Raymon E. Webb and Others
and
State Cooperators

(Forty-Second Annual Report to Cooperators)
Plant Industry Station
Beltsville, Maryland

March 1972

This progress report includes tentative results of research not sufficiently complete to justify general release. Such findings, when adequately confirmed, will be released promptly through established channels. Therefore, this report is not intended for publication and should not be referred to in literature citations.

PSR-28-72

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PLANT INDUSTRY STATION (Beltsville, Md.) and
CHAPMAN AND AROOSTOOK FARMS (Presque Isle, Maine)
R. E. Webb, David Wilson and James Frank

Distribution

Summaries of seed, seedling tubers, clonal lines and named varieties shipped to foreign countries and cooperating states and industry are given in tables 1, 2, and 3.

P.I. Table 1. Distribution of potato varieties, advanced selections, seedling tubers and true seed to foreign countries, 1971.

Country	Cooperator	Number of			
		Varie- ties	Selec- tions	Seedling tubers	True Seed
Australia	H. Hyland	1			
Bulgaria	C. Daskaloff	2			
Canada	D. A. Young		10		
Costa Rica	M. Seligson	3	11		
Ecuador	G. Romere R.		13		
El Salvador	I. Imle	6	74		
Hungary	AID	5			
India	H. Kishore	1	32		
Israel	J. Kirkun		11		
Malawi	AID	12			
Morocco	AID	5			
Nigeria	D. Suchomel			9,325	
Peru	Dr. M. Sosa				1200
Venezuela	E. A. Debrat	2			
	Jose A. Gonzales	<u>2</u>	<u>30</u>	—	—
TOTALS		39	181	9,325	1200

P.I. Table 2. Distribution of varieties and advanced selections to States, 1971.

State	Cooperator	Varieties	Selections
Alabama	J. L. Turner	2	28
Alaska	C. H. Dearborn	8	43
California	R. E. Voss	5	27
Connecticut	Arthur Hawkins	10	4
Colorado	Paul Newmann		36
	James Twomey		43
Delaware	Gene Brasher	2	18
	Robert Stevens		25
Florida	J. R. Shumaker	15	14
Idaho	M. D. Groskopp	1	7
	Joseph Pavak		43
Louisiana	James Fontenot	1	18
Maine	Robert Akeley		98
Maryland	Muriel J. O'Brien	28	
	Kenneth Deahl	9	45
	Lind Sanford		68
	James Kantzes	2	17
Minnesota	Florian Lauer		43
Mississippi	William Hawthorne	4	51
Nebraska	Robert O'Keefe		43
New Jersey	C. E. Cunningham		18
	G. D. Lewis	5	21
	R. L. Nickeson		36
New York	R. C. Cetas	1	16
	D. H. Fricke		14
	J. B. Sieczka	6	9
	M. Harrison	2	143
North Carolina	L. M. Nielson	5	
	F. L. Haynes		5
North Dakota	Robert Johansen		43
Ohio	J. P. Sleesman		68
	Lind Sanford		
	Floyd Lower	4	60
Pennsylvania	Joseph Harrington	6	2
Rhode Island	James Sheehan	7	2
	C. H. Beckman	6	
South Carolina	Wayne Sitterly	1	21
Tennessee	C. A. Mullins	1	9
Texas	Bruce Perry	4	44
Virginia	B. Graves	13	26
Washington	W. Hoyman		44
West Virginia	Robert Young	9	67
TOTAL		26 (coop.) 157	(38 coop) 936

P.I. Table 3. Distribution of first-year seedling tubers and true seed in the U.S. from Beltsville, 1971

State	Cooperator	Progenies No.	Seedlings No.	Seed No.
Colorado	James A. Twomey	351		
Maine	David Wilson	351		
North Carolina	Frank Haynes	—	<u>5060</u>	<u>5200</u>
	TOTALS	702	5060	5200

Chapman Farm

Approximately 52,000 seedlings representing 348 parental combinations from Beltsville were planted on Chapman Farm. From these about 1300 selections were made for observation in 12-hill lots in 1972.

From the 1971 12-hill selections, 248 were selected to be grown in the 60-hill increase plots and evaluated for vine type, maturity, fertility, tuber conformation, specific gravity, processing quality (chips and french fries) and yield. One hundred and twenty-three second-year selections were increased for distribution to cooperators and preliminary yield trials on Aroostook Farm. Two hundred and thirty-one selections of older vintage were increased for retrial by cooperators and advanced yield trials on Aroostook Farm, or maintained as breeding stocks because of quality and/or pest resistance characteristics.

Weather conditions were slightly on the dry side during the 1971 growing season. Yields were down somewhat but quality was excellent.

Aroostook Farm

Experimental design for all yield tests was a randomized block with four replications. All plots received 800 pounds of 15-15-15 fertilizer banded in 36-inch rows by a two-row planter. Clones to be tested were hand planted in 16-hill rows with 9-inch spacing. Cultural methods and materials for weed, insect and disease control were according to local recommendations. Rainfall during the season was as follows: May, 2.7 inches; June, 1.7 inches; July, 3.6 inches; August, 3.3 inches; September, 3.3 inches; and October (3 weeks) 2.5 inches. Temperatures were near normal throughout the growing and harvest season. At harvest all entries were graded and samples hand selected for specific gravity and quality evaluations. Specific gravity was determined by the air and water method. After specific gravities were determined the samples were divided and placed in 50° F and 40° F storage at 90 percent relative humidity.

Samples were fried after 4 months of storage. One set of samples from the advanced yield trials stored at 40° F were reconditioned for 2 weeks prior to frying. Potato chips were made from each sample by cutting the tubers in half and taking a 1/16-inch thick slice from each tuber with a rotary food slicer. Slices were rinsed in water and placed on paper towels to remove excess water. Chips were then fried at 350° F in Primex vegetable shortening until bubbling ceased.

A french fry plug 3/8-inch in diameter was cut from each half of the tubers in the sample. After plugs were trimmed, rinsed and excess water removed, they were fried at 375° F in Primex shortening for five minutes.

Each potato chip and french fry was classified after frying into color classes. Chip classes ranged from 1-very light to 10-very dark. French fry classes ranged from 1-very light to 5-very dark. Weighted averages were calculated by multiplying the number of chips or fries in each color class by the color class, totaled and divided by the number of chips or french fries in each sample. Color ratings were made using the PCII reference color chart 1206-U.

P.I. Table 4. Yield test of clones resistant to the Golden Nematode (race A) Arcostook Farm, Presque Isle, Maine 1971.

Pedigree	Yield per acre over 2 inches		Maturity	Tuber Rating	Specific Gravity <u>1/</u>	50° F			
	CWT	PCT				Chip Color <u>2/</u>	Fry		Texture <u>4/</u>
							Color <u>3/</u>		
BR6316-5	249	98	L	4	93	5.8	2.0		I
BR6316-7	325	97	L	3+	92	7.1	2.8		I
B6545-7	297	93	L	3+	75	9.3	4.0		I
B6741-2	263	97	L	3	84	6.7	2.2		I
B6741-3	208	96	ML	3+	83	6.3	3.0		S
B6741-11	280	97	ML	3	81	6.4	2.7		I
B6741-16	331	98	L	3	78	9.8	4.3		I
B6741-22	288	97	L	3+	75	8.1	3.4		S
B6741-23	269	96	L	3+	77	7.9	3.5		S
B6743-3	290	97	L	3+	71	8.7	4.0		I
B6750-3	312	95	L	3+	71	10.0	4.1		I
B6751-3	280	92	L	3	80	9.3	3.2		I
B6751-13	328	94	L	3	78	8.2	3.9		I
B6797-2	258	93	L	4	83	8.2	3.4		I
B6879-5	302	96	L	4	79	9.2	3.4		I
B6879-11	282	90	L	3+	72	8.8	3.7		S
B6887-6	389	97	L	4	81	10.0	4.0		S
Wauseon	285	97	L	2+	82	6.3	2.0		I
Peconic	267	95	L	3	98	6.4	2.3		I
LSD 5%	48								

1/ 1.0 omitted
2/ after four months storage; 1-light to 10-very dark; 7.0 or less acceptable
3/ after four months storage; 1-light to 5-very dark; 3.0 or less acceptable
4/ I - intermediate; S - soggy; M - mealy; I-M - acceptable

P.I. Table 5. Russet yield test, Aroostook Farm, Presque Isle, Maine, 1971. ^{1/}

Pedigree	Yield per acre over 2 inches		Maturity	Tuber Rating	Specific Gravity ^{1/}	50° F		
						Chip Color ^{2/}	Fry	
	CWT	PCT					Color ^{3/}	Texture ^{4/}
B7143-12	277	96	L	2	84	8.4	3.9	I
B7147-8	209	84	L	2+	96	8.2	3.4	M
B7147-9	154	89	M	4	88	6.8	3.2	M
B7147-17	298	94	L	2	91	9.0	4.2	I
B7147-64	188	91	M	4	87	8.0	3.1	I
B7147-83	243	94	L	2-	95	8.9	4.2	M
B7147-90	269	95	L	2	96	8.3	3.7	I
B7159-26	227	97	M	2	75	8.2	3.6	I
B7188-2	245	97	L	3	76	10.0	4.9	I
B7188-63	216	95	L	2-	83	8.9	3.7	I
B7196-4	210	91	M	4	82	7.3	2.8	I
B7196-7	166	85	M	3	80	9.0	4.4	I
B7196-23	259	95	L	3+	87	9.1	4.1	I
B7196-27	250	94	L	3	85	7.6	3.0	I
B7196-29	286	97	L	1+	86	9.7	4.6	I
B7196-30	271	93	M	2+	81	9.1	4.0	I
B7196-36	241	89	M	3	80	7.7	3.4	I
B7196-37	239	83	L	3	93	7.4	2.7	M
B7196-40	296	96	L	3+	85	9.0	4.2	I
B7196-74	257	93	L	2	92	7.8	3.5	I
B7196-101	215	82	L	2+	91	7.6	3.3	M
N. Russet	251	90	M	2+	91	9.8	3.9	I
R. Burbank	262	84	L	1+	89	7.9	3.8	I
LSD 5%	36							

^{1/} See footnotes at end of table 4.

P.I. Table 6. Chip and Fry yield trial, Arcostook Farm, Presque Isle, Maine, 1971. ^{1/}

Pedigree	Yield per acre over 2 inches		Maturity	Tuber Rating	Specific Gravity	Chip Color		Fry Color		Fry Tex. 40°-70° F ^{2/}
						50° F	40°-70° F ^{2/}	50° F	40°-70° F ^{2/}	
B5131-2	220	84	L	4	97	7.0	7.5	2.4	3.0	M
B5698-8	234	89	L	3+	98	5.7	6.1	2.2	2.2	M
B6495-20	240	94	L	3-	99	7.4	7.6	3.2	3.2	M
B6516-20	230	95	L	3	98	7.8	7.2	4.2	2.9	M
B6516-26	224	97	L	3-	94	5.8	6.5	2.2	2.5	M
B6532-4	286	95	L	4	96	7.8	8.6	4.5	2.4	M
B6562-14	258	94	L	3-	96	6.2	5.3	2.7	3.2	M
B6603-12	234	87	L	3	103	6.8	6.6	2.7	2.5	M
B5141-6	243	95	L	3	104	6.2	6.2	2.2	2.5	M
Kennebec	299	96	L	4	91	6.6	6.0	2.4	2.6	M
LSD 5%	35									

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^{1/} See footnotes at end of table 4.

^{2/} After four months storage at 40° F and reconditioned at 70° F for 2 weeks.

P.I. Table 7. Industrial potato yield test, Presque Isle, Maine, 1971. ^{1/}

Pedigree	Yield per acre over 2 inches		Tuber Rating	Specific Gravity	50° F		
					Chip Color	Color	Fry Texture
	CWT	PCT					
K83-13	117	69	3	.101			
K83-27	148	88	2	.092			
K85-6	149	93	3	.098			
K85-21	163	91	3	.091			
K86-9	90	54	3	.091			
K86-17	193	88	3	.093			
K112-2	188	87	3	.084			
K112-9	226	96	3	.090	7.6	3.0	1.4
K193-9	210	89	3	.092			
K194-3	170	83	2	.105	6.0	2.0	1.2
K194-4	230	92	2	.104	6.0	2.0	1.4
K195-9	237	95	3	.093			
K196-3	178	83	2	.104			
K198-2	156	83	2	.098			
K203-2	186	87	2	.100			
K208-3	188	94	2	.099			
K210-7	172	78	2	.093			
K211-1	229	96	3	.087			
K214-2	231	88	3	.084	4.0	2.0	1.8
K219-2	174	92	3+	.095	6.2	2.0	1.6
K219-5	212	95	2+	.085	6.0	2.0	1.0
K221-2	151	88	2+	.088			
K222-7	171	79	2+	.092			
K222-8	109	64	3	.089			
B5141-6	255	97	3+	.108	7.0	2.0	1.2
LSD 5%	45						

^{1/} See footnotes at end of table 4.

P.I. Table 8. Advanced early maturity yield test, Arcoostook Farm, Presque Isle, Maine, 1971. ^{1/}

Pedigree	Yield per acre		Tuber Rating	Specific Gravity	Chip Rating		Fry Rating		Fry Tex.
	CWT	PCT			50° F	40°-70° F	50° F	40°-70° F	
BR6443-7	233	95	3+	68	7.8	10.0	3.8	4.2	I
B6516-5	198	93	4	100	5.0	6.0	2.0	2.0	I
B6595-12	251	93	3	70	7.4	8.6	3.0	3.0	I
B6532-4	233	93	4	83	9.0	10.0	3.6	4.0	I
B6535-10	206	89	4	73	7.8	7.8	2.6	3.4	S
B6547-7	217	97	4	75	10.0	10.0	4.0	4.0	I
B6558-16	203	88	3+	86	8.6	8.8	3.6	3.8	I
B6597-20	187	92	4+	72	8.0	9.6	3.0	3.6	I
B6599-1	201	97	3	83	6.6	8.0	2.2	4.0	I
BR6617-2	206	97	3+	80	10.0	10.0	4.0	4.0	I
B6692-5	192	94	4	84	10.0	10.0	3.6	4.0	I
B6708-1	174	85	3+	94	7.2	8.4	3.4	3.4	I
B6731-2	161	87	3+	74	6.4	2.4	7.4	2.0	I
N. Russet	183	81	3	88	9.8	9.6	4.0	4.0	I
Cobbler	181	92	3-	92	6.8	8.4	3.4	3.4	M
LSD 5%	32								

^{1/} See footnotes at end of tables 4 and 6.

[illegible]

P.I. Table 10. Advanced late maturity yield test, Aroostook Farm, Presque Isle, Maine, 1971. ^{1/}

Pedigree	Yield per acre		Tuber Rating	Specific Gravity	Chip Rating		Fry Rating		Fry Tex.
	Cwt	ROI			50° F	40°-70° F	50° F	40°-70° F	
BR6290-3	238	95	3+	100	7.1	7.3	3.0	2.7	I
BR6293-12	241	94	4	92	6.0	6.0	2.0	2.1	I
BR6446-2	294	96	4	89	8.5	9.3	4.4	3.9	I
BR6463-2	259	95	3+	100	6.5	6.6	2.5	3.1	M
BR6495-12	306	93	3+	96	7.6	8.3	3.0	3.3	I
BR6495-20	306	95	3+	112	6.5	7.1	2.5	3.3	I
BR6516-18	252	94	3+	106	6.3	6.0	2.2	2.0	M
BR6516-19	214	95	3	92	6.3	6.2	2.4	2.6	M
BR6516-27	316	97	3+	96	7.1	7.9	3.1	2.5	I
BR6516-28	218	95	3	99	6.0	6.0	2.0	2.0	I
BR6518-4	338	96	3	97	6.9	6.5	3.4	2.5	I
BR6518-8	216	91	3	103	6.9	7.4	3.0	2.8	I
BR6519-5	291	96	3+	90	6.9	6.8	2.9	2.8	I
BR6519-6	166	99	3+	79	9.1	9.8	5.0	5.0	I
BR6527-33	264	94	3	86	6.6	7.8	2.9	3.1	I
BR6537-4	268	96	3	89	6.9	6.6	4.2	4.2	I
BR6567-12	295	94	3	86	7.7	9.3	3.5	4.8	I
BR6581-4	345	96	3-	91	7.1	7.0	2.6	2.9	I
BR6581-15	320	95	3	90	6.2	7.5	2.0	2.5	I
BR6595-5	266	95	3+	93	6.4	6.2	5.5	2.2	I
BR6596-1	340	96	3+	91	7.5	8.2	3.5	4.0	I
BR6603-6	287	96	3-	97	6.3	7.1	2.9	2.4	I
BR6614-1	269	96	3	97	7.0	7.5	2.7	3.2	M
BR6626-5	243	96	3+	96	7.6	7.7	2.8	3.1	I
BR662-1	233	95	3	94	7.5	7.2	2.6	2.3	I
BR662-9	260	96	3	93	7.3	7.0	2.6	2.0	I
BR662-22	301	96	3+	92	6.0	6.3	4.5	4.5	I
BR662-27	334	95	3	95	6.6	6.8	3.1	3.1	I
BR662-19	341	96	3	93	6.6	6.0	2.1	2.6	I
BR6712-9	282	96	3	94	6.6	6.4	2.6	2.1	I

P.I. Table 10. Continued

Pedigree	Yield per acre over 2 inches		Tuber Rating	Specific Gravity	Chip Rating		Fry Rating		Fry Tex. 40°-70° F
					50° F	40°-70° F	50° F	40°-70° F	
B6712-18	246	95	3	103	5.7	7.2	1.5	2.4	M
B6718-8	274	98	3	89	8.0	9.5	3.2	4.0	I
B6727-5	307	96	3+	86	6.7	7.7	3.0	2.9	I
B6741-11	256	96	3	85	6.0	6.1	2.4	2.1	I
B6741-22	277	96	3	84	7.2	8.4	3.1	3.3	S
B6741-23	270	95	3	86	6.7	7.5	2.1	3.4	I
B6747-5	259	98	3	82	8.7	9.6	4.2	4.2	I
B6750-3	262	95	3	76	8.9	10.0	3.5	5.0	I
B6750-7	250	95	3	93	8.4	10.0	3.5	4.2	I
B6751-3	271	89	3+	85	8.0	10.0	3.7	5.0	I
B6761-9	295	97	3	84	7.1	7.9	3.1	3.2	I
B6761-11	319	93	3	82	6.8	7.8	2.1	3.5	I
B6761-12	313	94	3	84	7.1	7.7	2.6	3.3	I
B6775-4	291	96	3	83	9.4	10.0	4.4	5.0	I
B6714-16	250	96	3	83	7.3	8.0	3.2	3.6	I
B6715-14	360	99	3	81	8.7	9.3	4.1	4.1	I
B6715-19	311	97	3	86	6.7	6.2	2.2	2.2	I
B6879-5	301	96	3	83	8.4	8.9	4.0	3.9	I
B6879-11	283	91	3	74	7.9	9.6	3.7	4.1	I
B6887-6	358	99	3	74	8.1	9.4	4.2	4.4	I
Abnaki	266	96	3	93	7.2	7.9	3.0	2.9	I
B5141-6	248	94	3	109	5.0	6.1	2.0	2.1	M
Katahdin	261	97	3	84	7.0	6.6	3.0	2.1	I
Kennebec	318	97	4	93	6.1	6.3	2.0	2.0	I
LSD 5%	45								

1/ See footnotes at end of tables 4 and 6.

P.I. Table 11. First year early maturity yield test, Aroostook State Farm, Presque Isle, Maine, 1971. ^{1/}

Pedigree	Yield per acre over 2 inches		Tuber Rating	Specific Gravity	Ratings Constant		
					50° F		
	CWT	PCT			Chip	Fry Color	Fry Texture
B6928-8	190	93	3+	86	6.4	2.4	I
B6929-10	201	91	3	88	8.3	3.9	I
B6951-1	183	86	3	85	7.8	3.5	I
B6952-3	184	92	3+	96	4.4	2.0	I
B6968-3	187	81	3+	80	7.9	3.5	I
B6969-1	181	85	3	82	6.6	2.3	I
N. Russet	188	80	3	86	9.3	4.9	I
Cobbler	198	90	3-	92	7.2	3.3	I
LSD 5%	46						

^{1/} See footnotes at end of table 4.

P.I. Table 12. First year medium maturity yield test, Aroostook Farm, Presque Isle, Maine, 1971. 1/

Pedigree	Yield per acre over 2 inches		Tuber Rating	Specific Gravity	Rating Constant 50° F		
					Chip Color	Color	Texture
	CWT	PCT					
B6712-2	176	96	3+	84	8.8	3.8	I
B6774-6	201	90	4	90	9.5	4.5	I
B6782-1	251	96	4	76	8.0	3.7	I
BR6820-14	206	91	3-	72	8.5	3.8	S
BR6820-15	240	91	4	76	7.6	3.1	I
BR6820-24	166	95	4	77	8.4	3.9	I
BR6848-4	171	90	4	85	8.0	3.2	I
BR6851-2	251	96	4	89	7.5	2.9	I
BR6858-2	257	97	4	78	8.8	3.5	I
BR6859-6	165	97	3+	93	7.5	3.1	I
BR6863-2	213	96	4	92	5.5	2.0	I
BR6863-3	209	96	4	95	6.0	2.0	I
BR6864-8	236	93	4	88	6.9	2.1	I
BR6864-9	265	94	3+	88	8.0	3.5	I
B6928-18	220	89	4	88	8.1	4.2	I
B6930-6	212	84	3+	86	7.8	3.7	I
B6932-9	263	98	4	81	8.1	3.6	I
B6936-9	202	94	3-	106	6.4	2.5	I
B6951-5	245	96	4	83	7.2	2.9	M
B6955-17	198	91	4	92	7.0	2.7	M
B6955-24	185	97	3	99	5.3	2.2	I
B6967-8	262	94	3	85	7.3	3.1	I
B6967-10	216	90	4	76	7.7	3.2	I
B6969-2	238	96	3	88	8.5	3.5	I
B6969-9	255	95	3+	83	7.8	3.0	I
B6974-2	323	97	4	69	10.0	4.5	I
B6987-54	214	95	3+	91	6.5	2.0	I
B6987-56	269	95	3+	101	7.0	2.9	I
B7003-1	222	89	3	75	8.7	3.6	I
B7005-4	237	94	4	75	7.3	2.8	I
B7021-6	286	96	4	74	9.7	4.2	I

P.I. Table 12. Continued

Pedigree	Yield per acre over 2 inches		Tuber Rating	Specific Gravity	Rating Constant 50° F		
					Chip Color	Fry Color	Texture
	CWT	PCT					
BR7047-11	160	91	4	88	7.8	3.0	I
BR7065-2	272	94	3	76	8.4	4.3	I
BR7106-5	203	93	4	94	6.0	2.0	I
BR7114-1	279	94	4	78	8.9	4.1	I
Cherokee	254	94	3+	89	7.0	2.5	I
Seminole	202	97	4	100	6.5	2.0	M
LSD 5%	45						

1/ See footnotes at end of table 4.

P.I. Table 13. First year late maturity yield test, Arcoosook Farm, Presque Isle, Maine, 1971. ^{1/}

Pedigree	Yield per acre over 2 inches		Tuber Rating	Specific Gravity	Rating Constant 50° F		
					Chip Color	Color	Texture
	CWT	PCT					
BR6480-3	285	93	3+	88	8.3	3.7	S
BR6486-1	254	92	3	92	6.9	3.0	I
BR6488-1	292	97	3	89	8.0	4.2	I
BR6491-6	283	98	3	112	7.8	3.6	M
BR6494-1	179	96	3+	101	6.7	2.2	M
BR6494-5	247	91	3	107	7.0	3.0	I
B6503-2	321	96	2+	92	6.0	2.0	M
B6518-5	242	88	3	100	6.5	2.8	M
B6532-14	211	71	3+	106	7.8	3.1	M
B6544-4	277	94	3+	90	7.9	3.5	I
B6553-15	230	95	3	95	6.2	2.2	I
B6695-1	172	93	4	108	8.8	3.8	I
B6716-8	206	96	3+	96	7.6	3.6	I
B6745-5	288	96	3	87	7.8	2.1	I
B6759-3	316	98	3	81	9.0	3.9	I
BR6820-10	284	90	3+	81	7.6	2.5	I
BR6820-26	304	95	4	87	7.6	3.2	I
BR6820-29	250	94	3+	94	6.2	2.0	I
BR6822-5	274	96	3	93	8.3	2.9	M
BR6824-1	241	94	3	90	6.7	3.2	I
BR6834-1	283	93	3	91	7.3	2.9	M
BR6854-4	232	93	3+	92	9.5	4.5	I
BR6862-2	251	98	4	93	6.6	2.6	I
BR6863-4	227	96	3	93	7.0	3.0	I
BR6871-5	301	94	3	95	7.2	2.8	M
BR6900-2	302	98	3	84	6.6	2.5	I
B6928-8	282	98	3+	77	7.8	2.8	M
B6930-1	260	99	4	88	7.8	3.5	M
B6930-7	355	94	3+	81	8.4	3.6	M
B6930-16	267	97	3	83	6.3	2.5	M
B6932-5	331	96	3	89	8.4	3.8	M
B6934-2	258	97	3+	77	7.7	3.0	M
B6934-9	290	93	4	84	6.9	3.1	M

P.I. Table 13. Continued

Pedigree	Yield per acre over 8 inches CWT FCT		Tuber Rating	Specific Gravity	Rating Constant 50° F		
					Chip Color	Fry	
						Color	Texture
B6934-12	309	95	3	93	7.5	2.3	I
B6935-4	279	93	3+	96	8.1	3.9	M
B6936-5	322	95	3	94	9.1	4.1	I
B6936-28	215	93	3	96	8.2	3.3	M
B6936-29	246	96	3	105	8.0	3.5	M
B6936-39	253	95	3	92	7.9	3.5	M
B6952-3	226	94	3+	91	6.8	2.5	M
B6955-6	312	97	3+	80	6.1	2.0	M
B6955-14	263	95	3	97	7.6	2.6	M
B6955-25	273	95	3+	82	7.5	2.9	M
B6955-33	217	91	3	97	6.5	2.0	M
B6955-35	246	96	3	96	6.1	2.0	M
B6966-1	341	95	3	93	8.8	3.9	M
B6967-9	269	97	4	89	6.9	3.0	M
B6974-1	317	93	3+	75	8.4	3.5	I
B6974-10	421	98	3+	68	8.9	3.9	I
B6974-14	369	97	3	84	7.4	3.1	M
B6974-28	316	96	3+	88	7.6	2.8	M
B6985-1	246	97	3	92	7.3	3.3	M
B6985-7	290	94	3	96	7.6	2.4	M
B6986-2	295	98	3	93	6.2	2.3	M
B6987-1	352	96	3+	94	7.3	2.4	M
B6987-2	315	96	3	92	7.3	2.3	M
B6987-18	271	93	3	85	6.7	2.6	I
B6987-22	218	95	3	93	6.8	2.0	M
B6987-25	225	95	3-	94	7.1	2.0	M
B6987-29	323	96	3+	104	6.2	2.1	M
B6987-37	266	95	3	95	7.2	2.3	M
B6987-43	261	93	3	93	5.2	2.0	M
B6987-48	262	91	3+	93	7.5	3.0	I
B6990-12	231	92	3+	84	8.0	2.6	M
B6990-19	242	94	3-	96	7.0	2.3	I
B6995-19	326	93	3	84	7.0	2.6	M
B7001-3	309	94	3	85	8.3	3.2	M

P.I. Table 13. Continued

Pedigree	Yield per acre over 2 inches		Tuber Rating	Specific Gravity	Rating Constant 50° F		
	CWT	PCT			Chip Color	Fry Color	Texture
B7001-4	305	97	3	82	7.3	3.1	M
B7001-18	281	94	3	93	6.5	2.0	M
B7001-20	301	97	3+	75	8.6	3.8	M
B7005-3	262	93	3	84	8.0	3.0	M
B7007-30	339	97	3	85	6.2	2.0	I
B7008-14	279	96	3-	79	7.6	3.5	I
B7009-4	332	97	3+	90	8.5	3.7	M
B7010-5	301	95	3	85	7.1	2.6	M
B7012-17	333	98	3	79	7.6	3.2	M
B7013-4	299	96	3+	88	8.8	3.9	M
B7019-1	298	98	3	80	8.3	3.8	I
B7024-4	295	95	3+	93	6.7	2.7	M
B7024-6	284	96	3+	96	6.0	2.0	M
B7024-7	308	96	3	95	7.0	2.1	M
B7024-10	309	96	3	90	7.5	2.5	I
B7024-17	346	98	3	100	7.8	3.2	M
B7029-1	315	99	3	76	7.8	3.3	M
B7033-14	263	97	3	96	6.9	2.4	M
B7033-24	318	95	3	92	8.4	3.9	M
B7033-26	310	94	3	95	7.2	3.0	M
B7033-33	250	96	3+	107	8.0	2.0	M
BR7044-2	258	96	3+	89	8.7	3.5	M
BR7047-2	324	98	3	91	8.1	3.1	M
BR7051-3	264	94	3	110	6.6	2.1	M
BR7058-2	346	97	3	81	6.5	2.5	M
BR7068-5	277	96	3	93	7.8	3.9	M
BR7072-8	281	99	3+	73	7.1	3.0	I
BR7072-12	255	97	3+	87	8.0	3.5	M
BR7076-3	271	96	3	90	6.4	2.5	M
BR7085-1	259	94	3+	101	6.7	2.0	M
BR7088-1	268	93	3	95	6.0	2.5	M
BR7088-2	320	98	3	96	6.5	2.4	M

P.I. Table 13. Continued

Pedigree	Yield per acre over 2 inches		Tuber Rating	Specific Gravity	Rating Constant 50° F		
					Chip Color	Color	Texture
BR7089-1	268	97	3	98	6.9	2.6	M
BR7091-1	336	98	3+	81	8.3	3.2	M
BR7093-4	280	99	3+	95	7.2	3.2	M
BR7093-5	284	98	3	95	6.0	2.0	M
BR7093-14	311	99	3	96	6.5	2.0	M
BR7094-2	292	94	3	94	6.2	2.4	M
BR7095-6	301	96	3	101	6.0	2.0	M
BR7095-9	294	97	3+	93	6.0	2.0	M
BR7098-2	285	98	3+	91	6.0	1.5	M
BR7103-2	329	98	3	96	8.0	3.5	M
BR7103-7	268	98	3	102	6.2	2.0	M
BR7103-8	301	97	3	91	7.5	3.3	M
BR7105-10	285	92	3+	86	6.5	2.0	M
BR7105-14	287	94	4	90	6.0	2.5	M
BR7106-1	224	91	3	100	6.8	2.0	I
BR7109-3	318	96	3	79	7.6	3.5	M
BR7110-1	337	94	4	87	7.7	3.2	I
BR7110-3	295	96	4	95	6.2	2.5	M
BR7111-3	240	95	3	96	7.8	3.1	M
BR7116-1	282	97	3	87	8.4	3.4	M
Abnaki	293	98	3+	88	8.6	3.4	M
B5141-6	254	94	3	110	6.0	2.0	I
Katahdin	279	98	3	87	7.2	4.0	M
Kennebec	310	97	4	90	7.0	3.2	M
LSD 5%	46						

1/ See footnotes at end of table 4.

Disease Resistance Evaluations

James Frank, David Wilson, and R. E. Webb

Disease resistance testing is carried out on Aroostook Farm at Presque Isle, Maine. Each test is located in its own isolated plot to prevent interference from other disease tests. The general procedures for each test are presented along with the pedigrees that were equal or superior to the resistant check plants. First year tests are replicated 2X while second year tests consist of 4 replications.

Weather conditions were generally good for all disease tests. The last two weeks of June had temperatures averaging near 78° F which was about 7° above normal for that period. July and August were near normal with temperatures of 75° F. Precipitation levels were below normal in June and July and above normal in the first two weeks of August.

Resistance to Verticillium wilt (*Verticillium albo-atrum*). Inoculum for this test was grown on potato dextrose agar in petri dishes. On the day of planting, the agar was removed from the plates and macerated with water in a Waring blender. The final concentration of spores was about 100,000 spores per ml. Two isolates of the pathogen were used to insure pathogenicity. The tubers of the test clones were cut, dipped in the inoculum and planted immediately. The inoculated seedpieces were covered with soil and a full hill was made immediately after planting.

Wilt readings were made on 8/2, 8/19 and 8/31/71. The 8/31/71 readings were taken for the two replications and averaged for a final foliar reading. The pedigrees listed had a final rating of 3.5 or lower on a 1-5 scale with 1 indicating no disease symptoms. This compared to an average of 3.5 for Houma and 2.5 for Abnaki, both resistant to *Verticillium*.

After tubers were harvested readings were taken to determine the percentage of tubers showing stem end browning and pink eye. The susceptible check Kennebec averaged 22% pink eye as compared to 8% for the resistant variety Houma.

The temperatures for the months of July and August were close to normal while moisture was generally below normal. These two factors along with the increase in spore concentration compared to last year provided a severe test for the seedlings.

Resistance to Common Scab (*Streptomyces scabies*). Tubers of the test clones were planted in the same field used in previous years for this test. Ratings were made on tubers dug on Labor Day and were graded 1-5 with 1 indicating little or no damage. The most severe ratings for each test clone are presented with area of tuber infected listed over type of lesion.

In 1970 the Green Mountain variety read a 5/5 while in 1971 a 3/4 or 4/4 was the average reading. The moisture conditions during tuber initiation were optimum for disease development. The acidity of the soil may be increasing thus accounting for the lower overall readings on Green Mountain.

1st Year Test

Resistant Pedigrees

(3.5 or lower; 5.0 = most susc.)

% Stem-end Browning

% Pink eye

DT3063-1R	47	0
B6480-3	49	0
B6544-4	48	2
B6943-21	66	6
B6943-26	54	5
B6943-27	60	8
B6943-33	60	0
B6952-14	55	3
B6952-16	45	5
B6980-47	80	2
B6986-18	80	6
B6987-29	40	0
B6987-136	40	8
BC7010-2	40	10
BR7065-2	24	2
BR7094-2	45	0
B7147-48	27	0
B7159-8	66	0
B7159-25	46	2
B7196-29	42	0
AC26040	70	14
Kennebec (sus)	68	2
Houma (res)	35	5
Abnaki (res)	20	3

2nd Year Test

Resistant Pedigrees

(3.5 or lower)

% Stem-end Browning

% Pink-eye

B6695-1	83	2
B6718-8	80	12
B6739-2	55	0
B6745-6	75	6
B6747-5	60	0
B6750-7	80	3
B6775-4	50	4
BR6863-2	65	5
Kennebec (sus)	82	31
Houma (res)	65	9
Abnaki (res)	70	2

1st Year Test

Resistant Pedigrees (1/2 or lower; 5/5 = most susceptible)

B6969-2	B6695-1	B7188-2
B6974-1	B7136-1	B7188-30
B6974-2	B7143-1	B7188-55
B6974-10	B7143-5	B7188-63
B6987-29	B7143-8	B7196-1
B7001-20	B7147-17	B7196-4
B7005-4	B7147-90	B7196-7
B7007-30	B7159-8	B7196-20
B7029-1	B7159-26	B7196-23
B7098-2	B7196-40	B7196-27
B7109-3	B7196-56	B7196-29
B6544-4	B7196-101	B7196-30
		B7196-36

2nd Year Test

Resistant Pedigrees (1/2 or lower; 5/5 = most susceptible)

B6679-6	B6761-11
B6695-1	B6775-4
B6703-2	B6799-1
B6747-5	BR6820-14
B6761-1	B6878-2

Resistance to Early Blight (*Alternaria solani*). With the increasing spread of early blight in northern Maine, the incorporation of blight resistance into commercial lines becomes mandatory. This year's test indicated several clones that had excellent resistance to Alternaria.

The test plot had plantings of B5281-1 (highly susc.) as every third row to serve as a spreader. The entire plot was sprayed with a spore suspension of the pathogen on 7/27 and 8/4. These sprays along with the natural infection observed provided a good inoculum density. Kennebec has been rated as a resistant variety and it had a reading of 4.2 out of 5.0 with 1 indicating no disease development. Readings were taken weekly starting on 8/11, with 9/10 as the final reading. The following results indicate all pedigrees showing resistance in our test.

Resistant Pedigrees (3.0 or lower; 5.0 = most susceptible)

B6692-9	B6705-12	B6712-2
B6712-9	B6712-18	B6745-6
B6747-5	B6750-7	B6761-9
B6761-11	B6761-12	

Resistance to Late Blight (*Phytophthora infestans*). Test clones were planted along with the variety Green Mountain, which served as a susceptible spreader. The Green Mountains were planted as guard rows and every third row in the plot. The plot was inoculated with a Race-0 (common race) zoospore suspension on 7/24, 7/27, 7/31 and 8/2/71. The outbreak of the disease was relatively slow due to the dry conditions in July. Foliar readings were taken on 8/12, 8/20, 8/27, 9/3 and the final reading on 9/10/71. Pedigrees listed below had final readings of 3 or lower on a 1-5 scale with 1 indicating no disease.

Resistant Pedigrees (3 or lower; 5 = most susceptible)

B6269-1	B6934-4	BR7058-2
B6269-14	B6936-29	BR7072-12
BR6463-1	B6974-10	BR7076-3
B6480-3	B6987-37	BR7085-1
B6553-15	B6990-14	BR7088-1
B6745-6	B6995-19	BR7091-1
B6820-10	B7007-30	BR7098-2
B6820-15	B7008-14	BR7103-7
B6820-29	BC7010-2	BR7105-14
BR6864-9	BR7051-3	BR7110-3
		BR7111-1
		AC26040

Resistant Pedigrees; Immunity to Virus X

B6488-1	B6951-1	B7003-1
B6491-1	B6951-5	B7005-3
B6491-5	B6966-1	B7005-4
B6491-6	B6967-9	B7013-4
B6712-2	B6983-11	BC7028-3
B6782-1	B6986-14	B7137-18
BR6820-10	B6986-24	B7149-4
BR6820-14	B6986-40	B7152-12
BR6820-29	B6986-55	B7153-29
BR6851-2	B6987-1	B7154-8
BR6864-8	B6987-18	B7154-10
B6930-1	B6998-19	B7154-14
B6930-6	B6998-37	B7169-7
B6930-7	B6998-39	B7198-5
B6930-16	B7001-18	B7200-10
		B7236-1
		AC26040

INTER-REGIONAL POTATO INTRODUCTION PROJECT (IR-1)

P. R. Rowe and R. W. Ross

Introduction of New Stocks. One hundred fifty-nine new stocks were received from eight countries. Three organized expeditions collected Solanum seeds and tubers in South America in 1971. K. A. Okada and W. Hoffmann, INTA, Balcarce, collected in Argentina. They donated 101 seed introductions, representing 11 species. J. G. Hawkes and P. Cribb, University of Birmingham, England, and J. P. Hjerting, Copenhagen, Denmark, collected in Bolivia and Peru. They donated 29 seed introductions representing 10 species. M. Matsubayashi, Kobe University, Japan, collected in Bolivia and Peru.

Preservation and Increase of Stocks. Approximately 90% of the species introductions are being maintained as true seed. Seed germination tests were carried out for 596 seed lots 2-16 years old. Recently harvested seed samples of 28 introductions were sent to the National Seed Storage Laboratory. Two hundred clonal selections were indexed for viruses, A, M, S, X and Y. Satisfactory increases of 111 seed introductions were obtained under glass, plastic or screen. A program to make interspecific hybrids not attempted before was conducted in the spring. Over 500 seeds were obtained from 134 crosses, 39 crosses produced enough seed to attempt an F_2 , and 65 failed.

Classification. Sixteen herbarium specimens were prepared from seedling populations. One hundred six and 42 herbarium mounts were sent to J. G. Hawkes, England, and C. Ochoa, Peru, respectively.

Distribution of Stocks. Shipments were sent to 19 states and 24 countries. Shipments included 1417 seed and 1367 tuber samples of species introductions, and 58 seed and 1490 tuber samples of germ plasm involving introduction developed by the cooperative USDA-Wisconsin Genetics and Cytogenetics Project.

More than 25 additional copies of the 1969 "Inventory of Tuber-Bearing Solanum Species" were distributed to potato researchers and libraries around the world. The inventory tabulates over 1500 introductions of wild and cultivated species currently available, and the data derived from published and unpublished reports of researchers utilizing them, through September, 1968.

Mimeographed listings of 191 species introductions available in the form of tuber families (mainly for the benefit of potato workers without adequate greenhouse facilities) were distributed to 149 scientists. The demand for this material has been so great, that this procedure has become a regular part of the program.

Evaluation of Stocks. The somatic chromosome numbers of 207 species introductions were obtained. Seedling families of 69 interspecific crosses (frost-resistant species x frost-susceptible S. tuberosum, and backcrosses to S. tuberosum) and 56 clones from the 1969 test were evaluated in the field at Sturgeon Bay for tolerance to freezing temperatures.

Usefulness of Findings. The major objective of the Potato Introduction Program is to promote and facilitate the improvement of the commercial potato in the United States by providing a readily available reservoir to useful breeding stocks.

Breeders are constantly searching for new sources of superior germ plasm and are conducting incessant researches to incorporate desirable new genes into adapted commercial varieties. Accomplishment of the major objective of this program must be measured largely by the success with which new, improved varieties meet the needs of commercial production.

One new potato variety with six introductions in its pedigree was released for commercial production in 1971. One hundred twenty-two of the 128 potato varieties developed and released in the United States since 1932 have two or more foreign introductions in their pedigree. These varieties comprise approximately 65% of the annual seed potato production in the United States.

Basic research programs being conducted in several states and other countries, are developing information concerning the potential value and diversity of the Solanum species. In 1970, 20 papers, eight abstracts, and six theses reporting the use of Solanum introductions were noted. These researches will provide the knowledge needed for more effective use of the Solanum species.

NORTH CENTRAL REGIONAL TRIALS - 1971

R. H. Johansen and Cooperators^{1/}

The North Central Regional Trials have now been in existence for twenty-one years. The first cooperative trial was conducted in 1950, and from year to year the number of states participating in the trial has varied. In 1971, Iowa dropped out of the trial but Nebraska and Indiana both planted a trial at two state locations. In 1972, South Dakota will no longer conduct a trial. Generally the reason for states dropping participation in the trial is that potatoes have become a lesser important crop in their state or the lack of time and funds. Potato production in the United States has now become more concentrated and specialized in the growing of seed, processing and fresh.

Over the years the trials have been very beneficial. The cooperator conducting the trial has done an excellent job in growing the trial and dispersing of the information of an advanced selection long before it is named. The judgement of the cooperator in evaluating a line has been highly advantageous to the breeder.

An example of the importance of the North Central Trial is found in the number of named varieties grown in the United States that were once tested as a number in the North Central Trial. In 1971, 20 varieties grown for certified seed in the United States had such distinction and eight varieties ranked in the top twenty.

Recent variety introductions that have been tested in the North Central Trial:

<u>Progeny No.</u>	<u>Year Released</u>	<u>Released By</u>	<u>Released Name</u>	<u>Parents</u>
I-6413	1970	Iowa	Iopride	I57324-52xI57324-37

Environmental Conditions. Soil type at each location ranged from clay loam to coarse sand. Sandy loam or silt loam was the most common soil type. The Louisiana trial was grown on alluvial Mississippi River bottom soil.

Cultural Practices. Fertilizer applications, irrigation, spray programs, vine killing, planting distance are based on local conditions.

For insect control the systemics Di Syston, Thimet and Phorate were used at planting time. Guthion, Thiodan, Sevin, and Chloradane were some of the insecticides applied later in the season. For late blight control, Polyram, Dithane, M45, Maneb, and fixed copper were some of the common fungicides used. Not all cooperators used herbicides, but Eptam seemed to be the most popular.

^{1/} Indiana, C.M. Jones; Kansas, J. Greig; Louisiana, J. Fontenot; Michigan, N. Thompson; Minnesota, O. Turnquist and F. Lauer; Missouri, V. Lambeth; Nebraska, R. O'Keefe; North Dakota, R. Johansen; Ohio, A. R. Mosley; South Dakota, C. M. Nagel and C. J. Mankin; Wisconsin, J. Schoennman, D. Kichefski, and S. Peloquin, USDA, R. Webb.

<u>State</u>	<u>Date Planted</u>	<u>Date Harvested</u>	<u>Total Days to Harvest</u>
Indiana (early)	4/14	7/21	99
Indiana (late)	5/15	10/15	154
Kansas	3/31	8/3	126
Louisiana	1/27	5/26	120
Michigan	4/29	9/22	147
Minnesota	5/11	9/8	121
Missouri	4/6	8/18	135
Nebraska (summer)	4/15	8/4	112
Nebraska (fall)	5/21	9/5	108
North Dakota	5/10	9/20	134
Ohio	5/18	9/30	136
South Dakota	5/18	9/17	123
Wisconsin	4/29	9/21	146

1971 was a fairly good year for good potato production. Rainfall was normal or above normal in most states except Michigan, where it was hot and dry for part of the season. Temperatures were also near normal in most states. The trial in Louisiana was planted at an early date, but drainage later was a problem. At least Louisiana did not lose their trial this year due to excess water. Irrigation was used in several states, and early frost was not a problem.

Entries. Entries were received from North Dakota, Nebraska, Wisconsin, Louisiana, and the USDA, Beltsville, Maryland. North Dakota supplied seed of the check varieties Norland, Cobbler, and Red Pontiac. Louisiana did not receive seed of the USDA selections, B6024-3, B6116-18, and B6097-9, and Indiana did not have sufficient seed of these USDA entries to plant in their trial at Vincennes.

Indiana planted a trial at South Bend, on May 15th (late) and a trial at Vincennes, on April 14th (early). Likewise, Nebraska planted a trial at Central City on April 15th (early summer) and a trial at Alliance, on May 21 (late fall).

Yield. Total and US No. 1 yields are reported in North Central Tables 1 and 2. Again Wisconsin reported the highest yields, followed by Ohio, Michigan and Indiana (South Bend). Lowest yields were reported from the states of Louisiana, Nebraska (Central City), and South Dakota.

In the so-called early group, ND7196-18 produced the highest total and US No. 1 yields. In the late group, Red Pontiac produced the highest yield followed by B6097-9. Red Pontiac and B6097-9 were also the highest yielding entries of both the early and late groups. While line ND7196-18 was the third highest yielding entry. W629 was the lowest yielding entry in trial.

Maturity. Again, Norland was the earliest maturing entry in trial, while Red Pontiac, W634, and B6097-9 were found to be the latest maturing. Maturity readings recorded at all locations are found in North Central Table 3. The effect of environment on the maturity of a particular breeding line or variety, is reflected in the erratic maturity readings that were recorded. A particular variety or selection might be extremely early at one location and extremely late at another. Most of the selections that were reported late actually averaged out as early as Irish Cobbler.

Total Solids. Line B6097-9 and Neb93.55-16 were found to produce the highest percent total solids. Red Pontiac and Norland produced the lowest percent total solids (North Central Table 4.). Many advanced selections were comparable to Irish Cobbler, and only two were nearly as low as Red Pontiac in percent total solids.

Scab Reaction. Missouri, Wisconsin and ~~South Bend~~, Indiana, reported no scab. Norland and W629 were the most scab-resistant entries in trial. Scab readings are found in North Central Table 5, and the percent scab recorded is found in North Central Table 6.

Internal and External Defects. The summary of the external and internal grade defects can show very interesting data. A particular weakness of a variety can appear and these weaknesses are starred for the benefit of the breeder or developer. Generally if an advanced selection has a known weakness or susceptibility to a particular defect, it will show up in this analysis. A summary of grade defects are found in North Central Table 6.

Overall Merit Ratings. Merit ratings are presented for the 1969, 1970 and 1971 seasons for possible comparisons.

	<u>1969</u>	<u>1970</u>	<u>1971</u>
Norland	13	23	27
Neb1.57-1	x	x	26
ND7196-18	x	17	24
W634	x	12	19
La22-111	x	14	17

x- not entered.

This was the second consecutive year that Norland had the highest total merit points. In 1969, Norland ranked fifth and in 1968, this particular variety was fourth. Generally Norland has always ranked as one of the top five in total merit ratings.

Chip Quality. North Central Table 8, shows the chip rating of the states that recorded such data. Several advanced selections, like W629, Neb1.57-1, Wisc634, ND6993-13 Russ, Neb49.62-5, Neb93.33-16, and ND7196-18 all showed good chipping ability. It is hoped that by next year all states will report chip quality.

North Central Table 1. Total Yield (cwt. per acre).

Variety	Ind. 1/		Ind. early	Kans.	La.	Mich.	Minn.	Mo.	Late 2/		N.D.	Ohio	S.D.	Wisc.	Ave.
	late	early							summer Neb.	fall Neb.					
ND6925-13 Russ	392	256		245	76	276	232	189	174	266	163	295	135	576	252
ND7196-18	296	281		457	151	355	364	247	146	308	210	342	170	715	311
Norland	389	303		287	122	349	237	218	145	281	204	238	116	556	265
Cobbler	338	285		376	106	339	301	221	127	286	238	353	163	544	283
Neb. 93.55-16	283	208		359	79	328	244	216	119	290	229	361	133	532	260
Neb. 1.57-1	318	232		276	100	374	251	131	155	292	181	537	84	606	272
Neb. 49.62-5	340	259		231	103	317	221	212	145	257	129	298	131	590	257
ND6993-13 Russ	304	232		196	91	318	218	178	141	259	213	314	106	605	244
Wisc. 629	318	228		247	117	292	204	189	123	246	139	266	97	525	230
Wisc. 634	383	169		211	100	347	247	162	106	245	234	414	82	655	258
La. 22-111	246	227		251	68	316	229	254	137	308	197	350	122	464	244
B6024-3	279			168		378	209	188	100	248	181	327	94	522	245
B6116-18	272			210		248	234	146	109	240	151	301	82	487	225
B6097-9	420			327		310	262	234	105	318	246	313	122	815	316
Red Pontiac	480	310		354	127	422	293	346	177	375	265	499	188	870	362
Average	333	249		280	103	331	250	209	134	281	206	347	122	604	

1/ Indiana Trials

a) Planted late May 15 at South Bend and harvested October 15.

b) Planted early April 14 at Vincennes and harvested July 21.

2/ Nebraska Trials

a) Planted late May 21 at Alliance and harvested September 5.

b) Planted early April 15 at Central City and harvested August 4.

North Central Table 2. US No. 1 Yield (cwt. per acre).

Variety	Late		Early	Ind.	Late	Ind.	Kans.	La.	Mich.	Minn.	Late		N.D.	Ohio	S.D.	Wisc.	Ave.
	Ind.	Ind.									summer	fall					
ND6925-13Russ							98	45	241	171	171	73	225	285	117	484	185
ND7196-18							287	112	321	301	234	86	239	333	139	636	259
Norland							232	105	332	221	208	87	248	213	105	514	223
I. Cobbler							300	86	310	289	211	78	220	337	155	450	241
Neb. 93.55-6							281	64	305	209	195	57	255	344	117	481	250
Neb. 1.57-1							214	79	346	207	121	112	254	522	69	554	241
Neb. 49.62-5							173	93	297	193	199	97	220	288	117	532	222
ND6993-13Russ							135	75	289	194	161	36	187	298	89	540	200
Wisc. 629							114	81	262	171	178	70	211	233	78	475	181
Wisc. 634							178	84	333	236	156	52	198	383	72	628	231
La. 22-111							216	61	303	214	246	61	256	333	115	441	221
B6024-3							109		355	175	175	43	210	306	89	482	212
B6116-18							167		228	179	133	44	187	284	66	434	186
B6097-9							233		288	218	218	45	259	300	107	760	265
Red Pontiac							261	109	398	285	328	106	257	480	182	820	349
Average							200	83	307	218	196	70	228	329	108	549	

North Central Table 3. Maturity Classification.^{1/}

Variety	Late Ind.		Early Ind.		Kans.	La.	Mich.	Minn.	Mo.	Late summer		Late Fall	Neb.	N.D.	Ohio	S.D.	Wisc.	Ave.
	Ind.	Ind.	Ind.	Ind.						Neb.	Neb.							
ND6925-13 Russ					5.0	2.0	2.0	1.0	2.5	2.5	2.5	1.5		2.0	3.0	2.0	3.0	2.4
ND7196-18					3.0	2.5	2.0	1.5	2.3	2.0	2.0	2.0		2.0	3.0	3.0	3.0	2.4
Norland					1.0	1.5	2.0	1.0	1.6	3.0	1.5	1.5		1.0	3.0	2.5	1.5	1.8
Cobbler					2.0	2.5	2.0	1.0	2.2	3.0	1.5	1.5		2.0	4.0	3.5	1.5	2.3
Neb. 93.55-16					4.0	1.5	3.0	2.0	4.2	2.0	2.0	2.0		2.5	2.5	2.5	2.5	2.6
Neb. 1.57-1					2.0	1.5	2.0	1.0	2.6	2.0	2.0	2.0		2.0	2.5	3.0	3.0	2.1
Neb. 49.62-5					3.5	3.5	3.0	1.5	2.8	1.5	1.8	1.8		2.0	2.5	3.0	2.0	2.5
ND6993-13 Russ					5.0	2.5	2.0	1.0	2.6	3.0	2.8	2.8		2.0	3.0	3.0	2.5	2.7
W 629					3.0	3.0	2.0	1.5	3.8	2.5	2.3	2.3		2.0	3.0	3.5	2.5	2.6
W 634					5.0	1.5	5.0	3.5	4.0	1.5	2.8	2.8		3.0	4.0	4.0	3.5	3.4
La. 22-111					3.0	3.0	2.0	1.0	2.5	2.0	2.0	2.0		2.0	4.0	3.5	3.0	2.5
B6024-3					3.0		3.0	1.5	3.4	3.0	2.0	2.0		2.0	3.0	3.0	2.0	2.6
B6116-18					3.0		2.0	1.0	3.2	3.5	2.2	2.2		1.8	4.0	3.5	2.5	2.7
B6097-9					5.0		4.0	2.0	3.8	2.0	2.5	2.5		2.5	4.0	3.0	3.5	3.2
Red Pontiac					5.0	3.0	4.0	4.0	3.8	3.0	2.5	2.5		3.0	4.0	3.5	4.5	4.0

- ^{1/}
- 1 - very early - Norland maturity.
 - 2 - early - Irish Cobbler maturity.
 - 3 - medium - Red Pontiac maturity
 - 4 - late - Katahdin maturity.
 - 5 - very late - Kennebec or Russet Burbank maturity.

North Central Table 4. Total Solids.

<u>Variety</u>	<u>Late Ind.</u>	<u>Early Ind.</u>	<u>Kans.</u>	<u>La.</u>	<u>Mich.</u>	<u>Minn.</u>	<u>Late summer</u>		<u>Late fall</u>	<u>N.D.</u>	<u>Ohio</u>	<u>S.D.</u>	<u>Wisc.</u>	<u>Ave.</u>
							<u>Mo.</u>	<u>Neb.</u>						
ND6925-13Russ	17.0	14.4	19.8	18.6	19.2	21.4	17.3	18.6	19.1	20.7	16.0	20.0	17.1	18.4
ND7196-18	16.4	15.3	20.0	18.2	18.6	21.8	18.4	18.2	18.7	20.5	16.8	20.6	16.9	18.5
Norland	15.0	12.9	17.6	16.5	15.8	19.0	15.6	17.0	17.2	20.1	18.5	18.0	15.4	16.8
Cobbler	16.6	14.7	20.6	18.6	18.2	21.4	18.0	19.3	18.9	20.9	19.5	20.9	18.8	19.0
Neb. 93.55-16	17.1	16.4	21.3	19.7	20.1	23.5	18.8	19.1	20.1	20.7	18.8	19.5	18.2	19.5
Neb. 1.57-1	15.5	15.6	20.4	18.2	17.5	21.2	18.2	18.4	18.5	20.9	17.4	22.0	17.3	18.5
Neb. 49.62-5	17.4	14.4	20.6	21.2	19.0	22.7	19.2	18.5	20.6	20.9	16.5	18.8	19.0	19.1
ND6993-13 Russ	16.3	13.6	18.5	17.1	19.2	21.4	17.5	18.9	20.2	20.5	18.9	20.0	19.4	18.6
W 629	16.4	14.7	19.2	18.4	18.2	22.2	18.6	18.4	19.4	20.9	19.5	19.0	17.7	18.7
W 634	17.0	14.0	19.0	17.3	19.9	23.5	18.8	16.9	19.1	20.7	19.0	21.2	19.7	18.9
La. 22-111	15.5	13.4	17.2	16.0	16.7	20.7	16.2	15.9	18.5	20.5	18.4	18.2	16.0	17.2
B6024-3	14.6		19.6		15.4	19.4	16.2	16.7	18.1	19.7	20.0	19.0	15.0	17.6
B6116-18	15.1		21.0		17.3	22.0	19.7	17.7	19.2	20.9	19.1	21.0	15.8	19.0
B6097-9	17.5		21.2		20.5	22.7	19.4	18.9	20.1	20.7	18.7	19.5	19.9	19.9
Red Pontiac	14.2	12.0	17.0	15.6	16.5	19.2	14.8	15.4	17.3	19.9	20.6	18.5	16.2	16.7
Average	16.1	14.3	19.5	18.0	18.0	21.5	17.8	17.9	19.0	20.6	18.5	19.7	17.5	

North Central Table 5. Scab Reactions Reported 1/ (most representative scab).

Variety	Late Ind.	Early Ind.	Kans.	La.	Mich.	Minn.	Late summer		N.D.	Ohio	S.D.	Wisc ² / Ave.
							Mo ² / Neb.	fall Neb.				
A-T												
ND6925-13Russ	0-0	0-0	1-1	0-0	1-1	0-0	0-0	4-1	T-1	1-1	T-1	
ND7196-18	0-0	0-0	1-2	0-0	1-5	3-3	2-2	5-1	1-1	T-1	1-3	
Norland	0-0	1-2	1-1	0-0	0-0	0-0	5-0	4-1	T-1	0-0	1-3	
Cobbler	0-0	T-1	3-1	1-1	1-5	2-4	0-0	4-1	2-1	1-1	3-2	
Neb. 93.55-16	0-0	0-0	1-1	1-1	1-1	0-0	1-2	2-1	1-1	T-1	T-1	
Neb. 1.57-1	0-0	0-0	1-1	1-1	0-0	0-0	0-0	2-1	T-1	T-1	3-3	
Neb. 49.62-5	0-0	1-4	1-1	0-0	1-1	1-2	1-1	3-3	1-1	2-2	2-2	
ND6993-13Russ	0-0	0-0	1-1	0-0	1-1	0-0	0-0	3-2	T-1	0-0	T-1	
Wisc. 629	0-0	0-0	2-1	0-0	1-5	0-0	2-1	3-3	T-1	0-0	1-1	
Wisc. 634	0-0	1-2	4-2	0-0	1-1	0-0	2-2	4-3	1-1	0-0	2-1	
La. 22-111	0-0	1-4	2-1	0-0	1-1	1-1	0-0	2-1	2-1	1-1	1-4	
B6024-3	0-0		1-1		1-4	0-0	0-0	4-1	T-1	T-1	1-2	
B6116-18	0-0		1-1		0-0	0-0	0-0	0-0	1-1	T-1	1-2	
B6097-9	0-0		1-1		0-0	0-0	0-0	4-2	1-1	1-3	3-1	
Red Pontiac	0-0	0-0	4-1	0-0	1-1	1-2	0-0	2-1	1-1	0-0	2-1	

1/ Area

Type

- T - less than 1%
- 1 - 1 - 20"
- 2 - 21 - 40%
- 3 - 41 - 60%
- 4 - 61 - 80%
- 5 - 81 - 100%
- 1 - small, superficial
- 2 - larger, superficial
- 3 - larger, rough pustules
- 4 - larger pustules, shallow holes
- 5 - very large pustules, deep holes

2/ No scab.

North Central Table 6. Summary of grade defects.

Variety	External				Internal				
	Scab	Growth Cracks	Second Growth	Sun Green	Total 1/ Free of Ext. Def.	Hollow Heart	Internal Necrosis	Vascular Discolor- ation	Total 1/ Free of Int. Def.
ND6925-13Russ	5.0	5.5	7.1*	1.6	80.0	2.8	2.8	11.2*	84.4
ND7196-18	15.9*	2.2	1.9	4.1	80.5	1.1	1.8	4.8	92.1
Norland	3.9	1.5	3.0	4.8	87.2	.5	1.5	6.5	92.2
Cobbler	15.0	.8	4.1	3.5	80.7	3.5	2.0	13.9	82.0
Neb. 93.55-16	10.7	.8	6.1*	3.4	82.0	2.3	9.9*	8.2	80.5
Neb. 1.57-1	9.8	2.4	2.0	3.0	83.4	trace	2.7	8.2	92.3
Neb. 49.62-5	15.7*	1.9	2.6	1.2	80.4	2.1	3.4	11.8*	82.5
ND6993-13 Russ	6.9	12.4*	18.5*	2.5	60.9	1.8	4.9	6.2	87.4
Wisc. 629	3.3	2.3	3.3	2.5	89.2	trace	2.5	5.8	92.0
Wisc. 634	15.0*	2.4	1.5	4.1	80.8	2.3	5.8	5.4	88.8
La. 22-111	7.1	6.0*	4.8	2.4	81.5	4.5*	2.1	11.5*	83.4
B6024-3	7.5	3.8	3.8	7.1*	79.6	7.4*	2.1	4.1	86.1
B6116-8	13.4	3.4	2.5	7.2*	76.6	2.9	4.0	6.5	89.3
B6097-9	6.4	3.5	2.3	7.5*	82.3	3.1	2.9	6.2	88.0
Red Pontiac	10.4	1.8	10.2	4.5	77.5	1.7	2.3	7.8	88.9

1/ Percent normal tubers showing no defects (some individual tubers had more than one type of defect).

* Possible weakness of variety.

North Central Table 7. Merit Ratings 1/

<u>Variety</u>	<u>Late Ind.</u>	<u>Early Ind.</u>	<u>Kans.</u>	<u>La.</u>	<u>Mich.</u>	<u>Minn.</u>	<u>Mo.</u>	<u>Late summer Neb.</u>	<u>Late fall Neb.</u>	<u>N.D.</u>	<u>Ohio</u>	<u>S.D.</u>	<u>Wisc.</u>	<u>Total Points.</u>
ND6925-13Russ	3					5		1	5					14
ND7196-1R		5	4	5			5			5				24
Norland	1	3	3	4		3	3	4	4	2				27
Cobbler			1				1				5	2		9
Neb. 93.55-16														-35-
Neb. 1.57-1		4		1	1				2				3	6
Neb. 49.62-5		2		2	2		2	5	3		3	5	1	20
ND6993-13 Russ								2				1	4	15
W 629		1		3									2	4
W 634	2				4	1				3	4		5	4
La. 22-111			5		3		4		1	1		3		19
B 6024-3											1			17
B6116-18					5									6
B6097-9	5		2							4				0
Red Pontiac								3			2	4		11
														9

1/ Merit Points determined as follows

<u>Merit Rating</u>	<u>Merit Points</u>
1	5
2	4
3	3
4	2
5	1

North Central Table 8. Chip Quality.

<u>Variety</u>	<u>Kansas</u>	Late fall <u>Neb.</u> ^{1/}	<u>Wisc.</u> ^{2/}
ND6925-13Russ	poor	3	70
ND7196-18	fair	2	76
Norland		2	72
Cobbler	poor	3	73
Neb. 93.55-16		3	76
Neb. 1.57-1	good	2	79
Neb. 4962-5		3	76
ND6993-13Russ		3	77
Wisc. 629	good	2	86
Wisc. 634	good	3	78
La. 22-111	good	3	70
B6024-3	poor	3	70
B6116-18	fair	2	72
B6097-9	poor	3	73
Red Pontiac	poor	5	70

^{1/} Chip color PCII values (the lower the number the lighter colored the chip).

^{2/} Chip score November 13, from storage at 50° and one of four replications. 70 - very dark, 80 - acceptable, 90 - very light color.

ALABAMA

J. L. Turner and Hubert Harris - Auburn University
Frank E. Garrett - Gulf Coast Substation
S. E. Gissendarner and John Eason - Sand Mountain Substation

Irish Potato Variety Trial, Sand Mountain Substation,
Crossville, Alabama

Experimental Procedure. Eight named varieties and thirty-four numbered selections were grown in replicated plots at the Sand Mountain Substation, Crossville, Alabama. Seedpieces were cut to approximately 1-1/2 ounces each, treated for rot control and planted on March 24. Fertilizer was applied as 600 pounds of 6-24-24 broadcast prior to planting and 800 pounds of 8-8-8 sidedress. Plots were planted March 17 and harvested July 12. Potatoes were graded into sizes A and B for yield data. Samples of each variety and breeding line were returned to Auburn for laboratory analysis.

Results. Yields for all varieties were well below what is generally considered an acceptable yield. Weather conditions were difficult at times with excessive rains and cold temperatures through May. Red La Soda performed poorly this year. Seminole produced the highest yield of the named white varieties. Breeding lines B6516-26 and B6532-4 produced yields in excess of 100 bags per acre. Line B6603-6 indicated a high degree of susceptibility to scab. Lines B6815-4, B6815-14, B6967-8, and B6967-9 had some internal discoloration when cut for inspection.

In general, the total solids of the tubers were not as high this year as they were last year in the variety planting at the Sand Mountain Substation. Of 16 varieties grown last year, none tested less than 19.1, 12 were 20 or above and the highest was 24.4 in percent total solids. Of 42 varieties tested this year, only 2 were above 20 and the range was 13.7 to 20.2 in percent total solids. Only 2 varieties this year made chips that were unacceptable, although 10 other varieties made chips that rated only fair in quality (below 7.6 on 1 to 10 scale).

Alabama Table 1. Potato Variety Trials, Crossville, Alabama, 1971

Variety	Yield Per Acre			Eye ^{1/} Depth	Scab ^{2/} Rating	Hollow Heart Rating	Black Heart Rating
	No. 1	No. 2	Total				
White Skin Varieties	Cwt.	Cwt.	Cwt.				
Kennebec	72.22	6.46	78.68	S	1	1	1
La Chipper	57.94	11.86	69.80	S	1	1	1
Norchip	60.60	15.71	76.31	M	1	1	1
Penobscot	64.22	12.04	76.26	S	1	1	1
Superior	58.11	12.99	71.10	S	1	1	1
Frito Lay 96	65.82	17.73	83.55	M	1	1	1
Frito Lay 282 (Seminole)	80.23	18.09	98.32	S	1	1	1
Wis. 623	61.55	17.61	79.16	S	1	1	1
Wis. 629	39.26	26.63	65.89	S	1	1	1
Wis. 6419	68.73	14.05	82.78	M	1	1	1
Wis. 664	63.21	18.56	91.77	S	1	1	1
B56617-8	31.55	11.56	43.11	S	1	1	1
B5665-7	52.66	12.75	65.41	S	1	1	1
B5698-8	38.78	10.97	49.75	S	1	1	1
B6495-10	81.42	6.23	87.65	M	1	1	1
B65035	70.45	7.41	77.86	S	1	1	1
B6516-3	45.07	12.04	57.11	S	1	1	1
B6516-10	15.24	6.23	21.47	M	1	1	1
B6516-20	39.55	6.17	45.72	S	1	1	1
B6516-26	110.65	6.11	116.76	S	1	1	1
B6532-4	94.05	9.37	103.42	M	1	1	1
B6532014	28.05	9.78	37.83	S	2	1	1
B6562-14	70.39	13.82	84.21	M	1	1	1
B6564-9	50.11	5.93	56.04	S	1	1	1
B6567-27	45.13	12.63	57.76	S	1	1	1
B6595-12	42.76	11.80	54.56	S	1	1	1
B6603-6	59.30	6.40	6.57	S	4	1	2
B6603-12	58.47	20.22	78.69	S	1	1	1
Red Skin Varieties							
La Rouge	68.20	14.47	82.67	M	1	1	1
Red La Soda	49.75	11.10	60.85	D	1	1	1
La 22-111	40.44	2.25	42.69	S	1	1	1
B5281-1	25.38	21.53	46.91	-	-	-	-
B6708-1	42.76	18.21	60.97	S	1	1	1
B0731-2	46.61	19.87	66.48	S	1	1	1
B6751-3	69.20	16.43	85.63	S	1	1	1
B6774-6	43.17	22.12	65.29	S	1	1	1
B6815-4	70.57	7.59	78.16	S	1	1	2
B6815-14	113.74	8.78	122.52	S	1	1	3
B6967-8	42.08	10.73	52.81	S	1	1	3
B6967-9	42.52	17.26	59.78	M	1	1	2
B6995-22	40.56	2.37	42.93	S	1	1	1
B7005-1	48.33	24.67	73.00	S	1	1	1

1/ S = Shallow; M = Medium; D = Deep

2/ 1 = None

5 = Severely affected

Alabama Table 2. Quality and Processing Evaluations on Potato Varieties and Breeding Lines Grown at Crossville, 1971 Crop. 1/

Variety	Raw tuber	Potato chips	
	properties:	Chip	Chip
	Total solids	color	weight
	2/	3/	4/
Kennebec	15.1	7.8	151
La Chipper	16.1	7.6	155
La Rouge	16.0	6.8	158
Norchip	17.5	8.4	163
Penobscot	18.1	7.6	165
Red La Soda	14.8	7.0	161
Superior	17.5	7.5	159
Frito Lay 96	16.8	7.8	161
Frito Lay 282	19.3	8.9	176
La 22-111	17.0	7.1	158
Wis. 623	16.1	8.4	155
Wis. 629	16.2	8.5	143
Wis. 64-19	13.7	6.0	147
Wis. 664	17.6	7.8	163
B5281-1	14.8	7.3	144
B6708-1	18.7	7.3	164
B0731-2	16.7	8.0	151
B6751-3	15.6	7.5	152
B6774-6	16.6	7.5	157
B6815-4	14.2	4.1	137
B6815-14	14.6	5.0	149
B56617-8	16.9	8.9	164
B5665-7	16.3	8.0	170
B5698-8	14.3	8.0	149
B6495-10	17.3	8.4	159
B65035	18.6	9.0	172
B6516-3	18.9	8.5	172
B6516-10	20.2	9.4	177
B6516-20	18.2	8.0	178
B6516-26	18.7	8.6	178
B6532-4	16.4	7.8	169
B65320-14	18.3	8.3	159
B6562-14	18.1	8.6	163
B6564-9	17.1	8.8	158
B6567-27	18.7	9.1	173
B6595-12	20.2	8.3	167
B6603-6	16.3	7.9	172
B6603-12	18.6	8.4	172
B6967-8	15.8	7.0	155
B6967-9	16.0	7.3	151
B6995-22	15.2	7.7	138
B7005-1	17.2	8.0	166

1/ Continued

Alabama Table 2. Footnotes Continued

- 1/ Mean of tests on samples from four randomized plots, grown at the Sand Mountain Substation. Potatoes were planted March 17, dug July 12, and processed July 22 and 23, without refrigerated storage.
- 2/ Determined by standard specific gravity method.
- 3/ Based on scale of 1 as very dark and unacceptable to 6 as barely acceptable to 10 as very light and highly acceptable.
- 4/ Weight in grams of fried chips from 454 grams of prepared slices (washed, friction peeled, sliced $1/20''$, washed, centrifuged, fried 2.5 to 3 min., 350° down to 325° F).

ALASKA

Curtis H. Dearborn

Environment at Matanuska. Potato soils were very dry at planting. Rainfall was ample for the crop after mid-July but soil and air temperatures were the lowest in 21 years. Air temperature dropped to 32° F on September 10. Frost susceptible vines were killed September 25 by a 28° freeze.

Cultural practices. Overhead irrigation was used as necessary prior to planting or after planting to maintain adequate soil moisture for potato production. The tuber-unit system of planting was used and seedpieces of all clones were planted 11 inches between pieces and 36 inches between rows. Planting was by machine using 8-32-16 fertilizer at 750 lb/A. Premerge at 7-1/2 quarts per acre was used for weed control. Disc hillers were used twice for ridging the rows otherwise there was no machine travel through the plots.

Maine-Beltsville potato clones. Seven clones from Beltsville seedlings of 1968 and 15 from the 1969 selections were retained for further testing and they are listed with pertinent characteristics in Tables 1 and 2. Clone B6694-4 was outstanding for 94 percent of its production meeting number 1 grade standard at 2-inch minimum diameter. Clone B6966-8 produced 94 percent of its tuber weight in tubers 2 inches in diameter or larger, but 17 percent of the total yield was green or had rough shoulders. The objectionable flavor of B5141-6 was not detected in clones carrying this parent. Fifteen russet-skinned clones as shown in Table 2 were saved from the 43 russet-skinned clones received in 1971. Yields are calculated from small plots and are not necessarily representative of a clones productivity. The crop was planted June 1 and harvested September 3, giving it a short growing season. Specific gravities indicate significant differences in dry matter. Clone B7147-83 was impressive in that all tubers were 2 inches or more in diameter.

Newer varieties and clones. Caribou, Chieftain and Iopride among 19 named varieties in six tuber-unit plots produced 311, 366, and 301 cwt/A respectively, of No. 1 grade, 2-inch and over tubers compared with Alaska Frostless at 342 and Green Mountain at 299 cwt/A. Chieftain showed leaf symptoms of mild mosaic in all units of a 96 tuber-unit increase block although the yield was good throughout. Varieties Superior and Seminole, were severely damaged by rhizoctonia particularly the latter with yield significantly reduced. Sclerotia are not normally found on potatoes at this latitude but Seminole tubers at harvest were heavily spotted. Among 19 numbered selections in the same planting B5400-8 produced 326 cwt/A and two "red's" Ak. 5-65-3-67 and Ak. 37-65-5-67 produced 307 and 399 cwt/A respectively.

For several years white-flowered rogues in Alaska 114 have been studied. Recently, personnel of the Vancouver, B.C. Potato Virus Laboratory determined that the white-flowered Alaska 114 contains potato S-virus whereas the original bi-colored flower type does not. A sample of this virus-free clone may be obtained on request.

Potato breeding. Breeding and selecting for earlier productivity, increased frost and scab resistance and better cooking qualities are being continued. Small tubers representing nearly 7,000 new clones and large tubers representing 330 selections from 42 crosses will be evaluated in 1972. Alaskan growers will have three clones for commercial trial in 1972, a white-skinned selection with good chipping qualities and good production, coded 3-58-35-68 and two red-skinned clones of better than average quality for reds. They are coded Ak. 5-65-3-67 and Ak. 37-65-5-67.

Alaska Table 1. Potato clones retained at Matanuska in 1971 from among those listed in Alaska Tables 1 & 2 of 41st. Annual Report to Cooperators, March 1971.

Pedigree	Parentage	Total Yield cwt/A.*	Yield No. 1 cwt/A.	No. 1 %	Sp. Gr.	Tuber Characteristics
B-6516-10	B-3627-18 X B-5141-6	259	179	69	1.090	Light chip**
B-6544-4	Wauseon X Cascade	448	332	74	1.080	Brown russet skin
B-6694-4	Chippewa X B-5141-6	323	304	94	1.089	High % No. 1, golden chips
B-6712-23	B-5287-16 X B-5141-6	447	308	69	1.073	Long oval, greens badly
BR-6820-29	Wauseon X B-3819-17	421	298	71	1.074	Hollow Ea., greens badly
B-6930-6	R-4808-8 X B-3692-4	502	344	69	1.072	Productive, greens badly
B-6966-8	DT-5997-IR X Saranac	501	387	77	1.078	Productive

* Data from 40 hill plots.

**All chip notes are from tubers held at 50°F until 3 December 1971 when chipped, Harvested 14 September 1971.

Alaska Table 2. Russet-skinned potato clones retained at Matanuska in 1971 from 43 received from Beltsville in April 1971.

Pedigree	Parentage	Total		Yield No. 1 cwt/A	No. 1 %	Sp. Gr.	Tuber Characteristics
		Yield cwt/A*	Yield No. 1 cwt/A				
B7143-5	Marygold x B4087-5	257	198	77	1.081	Yellow flesh	
B7143-12	Marygold x B4087-5	416	325	78	1.064	Dark yellow flesh	
B7147-9	Penobscot x W39-1	257	194	75	1.098	Long smooth oblong	
B7147-17	Penobscot x W39-1	313	214	68	1.097	Light yellow flesh	
B7147-48	Penobscot x W39-1	360	206	57	1.084	Light yellow flesh	
B7147-83	Penobscot x W39-1	356	356	100	1.091	Yellow flesh, uniform	
B7147-90	Penobscot x W39-1	333	293	88	1.094	Creamy flesh	
B7159-26	Penobscot x W39-1	396	190	48	1.074	Shatters badly	
B7196-20	168-3 x B5412-10	392	364	92	1.079	Growth cracks	
B7196-29	B4523-8 x W245-2	348	305	87	1.071	Red flesh at bud end	
B7196-36	B4523-8 x W245-2	265	206	78	1.073	Stolons adhere	
B7196-37	B4523-8 x W245-2	325	261	80	1.079	Smooth oval	
B7196-56	B4523-8 x W245-2	356	234	66	1.074	Shatter common	
B7196-77	B4523-8 x W245-2	142	59	42	1.072	Attractive, cylindrical	
B7196-101	B4523-8 x W245-2	420	356	85	1.072	Very dark skin	

*Yield data may not be very reliable, but specific gravity and tuber characters are indicative of the clone's characteristics.

ARIZONA

Paul M. Bessey

Potato trials were conducted by the University of Arizona at Queen Creek, Mesa, Phoenix, and El Mirage, Arizona. There were 35 varieties and advanced clones in a replicated trial and an advanced clone trial with 259 selections. C₂ clonal selections from the USDA, Aberdeen, Idaho, totaled 433 for Arizona screening. The total glycoalkaloid test was grown for the USDA. Cooperative plantings were also made for Colorado State University to evaluate adaptability of their advanced lines and the University of Nebraska as a winter test for potato diseases.

Data is given in the tables for yields, grades, specific gravity, tuber description, and chip characteristics for the replicated trial, observational trial, and clonal screening of C₂ lines from the USDA, Idaho.

The replicated trial (replicated three times) was planted February 1, 1971, at Queen Creek, Arizona. Spacing was 8.8 inches in 34-inch beds. Fertilizer (16-48-0) was applied at the rate of 1050 lbs/acre in two bands four inches to the side and one inch below the seedpiece. Phorate at two lbs/acre actual was applied in one band. Furrow irrigation was used. Weeds were controlled in two cultivations. Harvest was June 8, 1971. Yield and other data are shown in Arizona Table 1.

Observation trials were planted January 29 and 30, 1971, also at Queen Creek at 10.8-inch spacing in the row. Fertilizer was applied at 1100 lb/acre and phorate at one and one-half lb/acre. Remaining factors were the same as in the replicated trial. Data are shown in Arizona Table 2.

The C₂ clonal screening was split with 39 selections tested in Queen Creek planted January 30 and the remaining 394 at Mesa planted March 4 in five-hill plots. Spacing at Queen Creek was 10.9 inches and in Mesa 8.8 inches. Fertilizer rate was 1050 lbs/acre of 16-48-0 applied with two lbs/acre of phorate in the same manner as the other trials. The Queen Creek plots were harvested June 28 and the Mesa plots July 6. Clones retained are shown in Arizona Table 3.

Planting and harvesting conditions for the TGA test at Mesa were the same as for the C₂ screening test and can be directly compared with the C₂ lines. Data are shown in Arizona Table 4.

Arizona Table 1. Yield, specific gravity, tuber appearance, chip color and yield of potato clones grown at Queen Creek, Arizona--1971 (Replicated)

Variety or clone	Yield			Spec- ific grav- ity 1/	Tuber appearance ^{2/}			Chips	
	J's	A's	Total		Surface	Shape	Eyes	Color	Yield
	Over 3" cwt/a	1-7/8" to 3" cwt/a	cwt/a					3/ %	
Abol14-3	72.0 d-14/	196.0 d-i	268.0 e-k	92	Wh/SRus	Lng/Ov/Tk	Sh	4.2	35.7
Abol05-3	13.1 k-m	231.7 c-g	244.8 g-k	83	Wh/SRus	Lng/Tk/Bky	Vsh	4.3	36.4
Abol15-1	104.2 c-h	240.0 c-f	344.2 b-f	84	Wh/SRus	Tk/Rnd/Ov	Vsh	3.5	35.4
Abol16-1	10.0 l-m	275.0 c-d	285.0 c-k	91	Wh	Ov/Tk/Bky	Vsh-M	5.7	34.7
Abol21-5	3.3 m	256.7 c-e	260.0 f-k	82	Tan	Tk/Bky	Vsh	7.3	34.4
Abol30-1	23.1 k-m	217.5 c-i	240.6 h-k	88	Wh/SRus	Ov/Tk	Vsh	5.7	36.0
Abol55-3	20.8 k-m	107.1 j-m	127.9 m-o	84	Wh/SRus	Ov/Flt/Bky	Vsh	7.0	35.9
Abol93-2	47.1 h-m	286.7 b-c	333.8 b-g	90	Wh/SRus	Ov/Tk	M	5.2	35.6
Abol93-9	43.3 i-m	182.5 e-k	225.8 i-l	84	Wh/SRus	Tk/Bky/Irrg	Sh-D	5.5	34.7
Abol107-1	16.8 k-m	97.5 l-m	114.3 n-o	82	Wh/SRus	Flt/Ov/Tk	Sh	5.0	36.0
Abol107-6	33.3 j-m	165.0 f-l	198.3 k-n	79	Wh/SRus	Tk/Bky/Flt	Sh	5.0	34.2
Abol107-9	98.7 c-i	198.3 d-i	297.0 c-j	88	Wh/SRus	Tk/Bky/Flt	Sh	6.3	34.3
Abol107-25	5.2 m	100.4 k-m	105.6 o	88	Rus	Rnd/Ov	Vsh	4.7	35.2
Abol107-26	8.1 m	143.3 h-m	151.4 l-o	91	Wh/SRus	Lng/Ov/Bky	Vsh	4.3	36.7
Abol107-28	44.4 h-m	174.2 e-l	218.6 j-l	84	Wh/SRus	Ov/Tk	Vsh	7.2	34.6
Abol110-1	27.3 k-m	343.3 a-b	370.6 b-c	88	Wh/SRus	Ov/Tk/Bky	Vsh	6.0	35.3
Abol110-2	183.8 a	139.2 h-m	323.0 b-h	85	Rus	Flt/Ov/Irrg	Vsh	7.2	35.8
Abol110-3	112.1 c-f	206.7 c-i	318.8 b-i	84	Wh/SRus	Ov/Tk/Bky	Vsh	6.5	33.1
Abol110-7	118.7 c-d	281.7 b-c	400.4 b	86	LtRus	Tk/Ov/Flt	Vsh-M	6.7	34.0
Abol110-10	136.9 a-c	367.0 a	503.9 a	90	Wh/SRus	Tk/Ov/Flt	Vsh	6.2	35.1
Abol110-11	150.1 a-c	150.0 g-m	300.1 c-j	88	Wh/SRus	Tk/Ov/Irrg	M-D	6.3	34.3
Abol110-15	130.6 a-d	220.8 c-i	351.4 b-f	87	Wh/SRus	Lng/Tk/Bky	Vsh	7.3	31.7
Abol110-16	108.7 c-g	135.0 i-m	243.7 g-k	82	Wh/SRus	Tk/Bky/Irrg	Sh	6.0	34.0
Abol110-17	48.4 g-m	73.9 m	122.3 n-o	86	Wh	Ov/Tk/Bky	Vsh	6.7	34.7
Abol102-1	99.4 c-i	188.5 e-j	287.9 c-k	74	Wh/SRus	Ov/Tk/Flt	Vsh	7.7	31.9
NDA8136-1	36.5 j-m	176.7 e-l	213.2 j-l	73	VLtRus	Ov/Tk/Bky	Vsh	6.7	32.1
NDA8139-2	39.2 i-m	230.8 c-g	270.0 d-k	82	Wh	Lng/Bky	Vsh	6.0	34.6
221-2	55.8 e-m	152.1 g-m	207.9 j-m	81	Red	Tk/Bky/Flt	Vsh	4.2	34.3
Nen 1.57-1	75.2 d-k	207.5 c-i	282.7 c-k	83	Wh/SRus	Rnd/Tk/Ov	M	4.3	35.2
Nen 49-62.5	176.7 a-b	178.3 e-l	355.0 b-e	94	Red	Rnd/Tk/Irrg	D	4.3	38.4
Nen 93-55.16	54.0 f-m	241.7 c-f	295.7 c-j	87	Wh	Rnd/Tk	M	4.0	35.1
Sioux	186.0 a	178.3 e-l	364.3 b-d	84	Red	Rnd/Tk	M	7.3	33.6
Shurchip	122.5 b-d	210.8 c-i	333.3 b-g	80	Wh/SRus	Flt/Rnd/Ov	M-D	3.8	37.3
Worgold	115.8 c-e	222.9 c-h	338.7 b-f	79	Rus	Ov/Tk/Bky	Vsh	7.0	33.6
Nennebec	93.3 c-j	251.7 c-f	345.0 b-f	91	Wh	Lng/Tk/Bky	Vsh	4.7	38.5

1/ Specific gravity determined by potato hydrometer. (1.0 omitted)

2/ Tuber appearance: Wh - white, Red, Rus - russet, S - slight, V - very, Rnd - round, Flt - flat, Lng - long, Tk - thick, Ov - oval, Irrg - irregular, Unif - uniform, Bky - blocky, Sh - shallow, M - medium, D - deep.

3/ Chip color estimated from Caughlin (PCI) Color Chart, 1=white to 10=burned.

4/ Means followed by the same letter are not significantly different from each other. (p = .05)

Arizona Table 2. Yield, specific gravity, tuber appearance, chip color and yield of potato clones grown at Queen Creek, Arizona--1971 (Observation)

Variety or clone	Yield			Spec- ific grav- ity 1/	Tuber appearance2/			Chips	
	J's	A's	Total		Surface	Shape	Eyes	Color	Yield
	Over 3" cwt/a	1-7/8" to 3" cwt/a	cwt/a						
(Advanced Selections)									
A54184-1	177.5	174.1	351.6	83	Wh/Rus	Rnd/Ov/Tk	Sh	7.0	34.4
A6334-19	19.8	192.6	212.4	88	Rus	Lng/Tk/Bky	Vsh	6.0	35.6
A6334-20	18.4	204.1	222.5	82	Rus	Lng/Tk/Bky	Vsh	7.0	38.4
A6360-2	11.5	25.0	36.5	87	Wh	Ov/Tk/Bky	Sh	6.0	38.0
A63126-2	90.9	276.4	367.3	87	Tan/Rus	Lng/Tk/Bky	Sh	5.0	35.4
A64147-7	6.6	162.2	168.8	76	Wh/SRus	Pnt/Lng	Vsh	5.0	36.0
A64189-6	12.3	366.6	378.9	94	Wh	Lng/Bky	Vsh	5.5	37.6
A6612-2	---	103.6	103.6	82	Wh/Sm	Ov	Vsh	4.0	36.6
A6621-8	5.8	104.4	110.2	79	Wh	Rnd/Ov/Irrg	Sh	5.0	34.8
A6655-2	11.6	150.1	161.7	85	Tan/Rus	Tk/Bky	M	7.0	36.0
A6680-1	1.1	209.8	210.9	68	VLtRus	Lng/Tk/Bky	Vsh	8.0	31.4
A6693-1	22.6	127.0	149.6	86	Wh/SRus	Lng/Tk/Bky	M	5.0	35.6
A6693-11	106.4	168.4	274.8	81	Wh/SRus	Tk/Bky/Irrg	Vsh	5.0	36.6
A66102-1	4.8	130.4	135.2	72	Wh/Sm	Rnd/Tk/Irrg	Sh	4.0	34.2
A66107-3	20.0	120.0	140.0	85	Wh	Lng/Tk/Pnt	Vsh	7.0	35.4
A66107-4	11.6	109.2	120.8	82	Wh/SRus	Rnd/Ov/Tk	Vsh	4.0	36.8
A66107-5	8.1	95.0	103.1	87	Wh/Sm	Ov/Tk	Vsh	5.0	36.7
A66107-7	19.7	112.7	132.4	84	Wh/SRus	Lng/Bky/Flt	Sh	7.0	35.4
A66107-10	18.5	162.6	181.1	77	VLtRus	Lng/Pnt/Tk	Sh	5.5	34.2
A66107-12	---	140.6	140.6	77	Tan/SRus	Lng/Pnt/Irrg	Vsh	6.0	34.8
A66107-13	96.2	185.3	281.5	96	Wh	Tk/Bky	Sh	6.0	37.2
A66107-17	37.8	171.5	209.3	84	Tan/Rus	Tk/Bky/Irrg	M	7.0	36.6
A66107-24	---	112.6	112.6	83	Wh/SRus	Ov/Bky	Vsh	4.0	37.0
A66107-32	12.5	115.6	128.1	83	Wh/SRus	Lng/Tk/Bky	Vsh	7.0	37.2
A66107-34	46.0	183.3	229.3	83	Wh/SRus	Rnd/Ov/Tk	Vsh	7.0	31.6
A66107-35	2.0	107.4	109.4	79	Wh/SRus	Lng/Pnt/Bky	Sh	4.0	35.0
A66110-4	49.0	193.5	242.5	78	LtRus	Tk/Bky	Vsh	8.0	33.2
A66110-6	113.2	144.9	258.1	100	Rus	Lng/Tk/Flt	Sh	8.0	36.0
A66110-12	103.8	190.0	293.8	104+	Tan/Rus	Bky/Flt	Sh	6.0	42.8
A66110-13	137.6	192.6	330.2	94	Wh/SRus	Irrg/Bky	Sh	5.0	34.8
A66118-3	16.3	216.1	232.4	85	Wh/Rus	Lng/Bky/Irrg	Sh	5.0	36.6
A66125-3	48.1	156.2	204.3	92	LtRus	Tk/Bky	Vsh	7.0	38.6
A66125-4	38.4	178.1	216.5	86	Wh/SRus	Lng/Tk/Bky	Vsh	5.0	38.2
NDA8099-1	81.2	315.0	396.2	88	Tan	Tk/Bky	Sh	6.0	37.4
NDA8099-2	13.4	240.8	254.2	91	Wh/Rus	Lng/Ov/Irrg	Vsh	7.0	36.0
NDA8128-1	---	92.2	92.2	83	Wh	Lng/Pnt	Vsh	7.0	35.6
NDA8134-2	6.7	172.9	179.6	71	Wh/SRus	Lng/Ov/Bky	Sh	8.0	34.8
NDA8139-1	65.7	103.0	168.7	78	Wh/Rus	Tk/Bky	M	7.0	34.0

Arizona Table 2. Continued

Variety or clone	Yield		Total cwt/a	Spec- ific grav- ity 1/	Tuber appearance ^{2/}			Chips	
	J's Over 3" cwt/a	A's 1-7/8" to 3" cwt/a			Surface	Shape	Eyes	Color	Yield
								3/	%
(Intermediate Selections)									
A6713-11	85.0	323.0	408.0	85	LtRus	Lng/Tk/Bky	Vsh	7.0	34.4
A6715-2	88.4	221.0	309.4	78	VLtRus	Lng/Tk/Bky	Vsh	7.0	34.4
A6715-8	---	34.8	34.8	94	Wh/2G	Irrg	P	7.0	34.4
A6715-9	---	47.6	47.6	62	Wh/Rus/2G	Irrg	M	9.0	28.6
A6715-11	102.0	190.4	292.4	80	LtRus	Ov/Flt	Vsh	4.0	34.4
A6721-1	19.5	184.3	203.8	93	Wh/SRus	Lng/Ov/Flt	Vsh	8.0	34.4
A6721-8	24.4	144.0	168.4	85	VLtRus	Tk/Bky	Sh	7.0	34.4
A6721-12	19.2	165.9	185.1	94	Rus/GC	Ov	Vsh	6.0	40.2
A6723-12	17.8	189.2	207.0	85	Rus	Tk/Bky/Flt	Vsh	7.0	34.8
A6737-13	78.2	153.0	231.2	79	LtRus	Lng/Tk/Flt	Vsh	8.0	30.8
A6739-3	---	299.2	299.2	72	Rus	Lng/Tk/Bky	M	7.0	34.4
A6740-2	9.4	197.1	206.5	99	Rus	Lng/Tk	M	6.0	34.4
A6740-9	14.1	210.8	224.9	95	Rus	Ov/Irrg/Flt	M	7.0	34.4
A6741-2	3.0	122.0	125.0	85	LtRus	Ov	Vsh	5.0	34.4
A6741-10	114.4	125.8	240.2	73	Rus	Lng/Bky/Flt	Vsh	6.0	32.4
A6741-29	180.2	204.0	384.2	83	LtRus	Lng/Tk/Bky	Vsh	7.0	34.4
A6742-2	95.2	411.4	506.6	71	Rus/2G	Tk/Bky/Irrg	P	7.0	34.4
A6742-4	---	163.2	163.2	81	Rus	Lng/Pnt/Flt	Vsh	4.0	34.4
A6742-8	102.0	156.4	258.4	76	VLtRus	Tk/Bky	Vsh	7.0	34.4
A6745-1	96.3	97.4	193.7	86	Rus	Rnd/Flt/Irrg	Vsh	6.0	34.4
A6745-2	---	200.6	200.6	80	LtRus	Lng/Tk/Pnt	Vsh	7.0	34.4
A6745-7	6.3	212.8	219.1	86	LtRus	Ov/Tk	M	7.0	34.4
A6746-3	---	149.6	149.6	70	LtRus	Lng/Pnt	Vsh	8.0	34.4
A6748-2	---	217.6	217.6	79	LtRus	Lng/Tk/Bky	Sh	7.0	34.4
A6748-4	---	81.6	81.6	78	LtRus/2G	Irrg/Bky	P	8.0	34.4
A6750-2	183.6	153.0	336.6	91	Rus	Rnd/Flt	M	7.0	34.4
A6751-10	31.5	192.4	223.9	95	Rus	Ov/Flt	Sh-M	5.0	34.4
A6751-18	102.0	187.0	289.0	90	Rus	Lng/Pnt/Tk	Vsh	6.0	34.4
A6760-2	---	178.6	178.6	97	LtRus	Tk/Bky	M	4.0	34.4
A6767-2	1.8	29.4	31.2	79	LtRus	Rnd/Flt/Irrg	M	8.0	34.4
A6771-2	---	166.6	166.6	83	Rus	Ov/Pnt	Vsh	3.0	34.4
A6771-7	---	346.8	346.8	83	Wh/Le	Ov/Pnt	Vsh	5.5	34.4
A6775-1	5.2	131.1	136.3	77	Rus	Ov/Tk/Flt	Vsh	6.0	34.4
A6775-2	---	217.6	217.6	80	Rus	Tk/Bky	Vsh	7.0	34.4
A6789-2	47.6	112.2	159.8	78	LtRus/2G	Tk/Irrg	Vsh	8.0	34.4
A6789-4	9.4	128.8	138.2	85	Pink	Ov/Tk	M	3.5	37.4
A6789-5	39.7	128.0	167.7	95	Pink	Rnd/Tk	M	5.0	34.4
A6789-6	48.0	112.5	160.5	84	Wh	Rnd/Ov	Sh-M	4.0	34.4
A6789-7	54.5	230.3	284.8	90	Wh	Tk/Bky	Vsh	4.0	34.8
A6791-2	136.0	292.4	428.4	78	LtRus	Rnd/Tk/Irrg	Vsh	8.0	34.4
A6791-9	28.1	196.6	224.7	94	Wh	Tk/Bky	Vsh	7.0	34.8
A6794-3	71.4	238.0	309.4	79	Rus	Tk/Bky	Vsh	6.0	34.4
A6794-5	---	88.4	88.4	78	LtRus	Lng/Tk	Vsh	7.0	34.4

Arizona Table 2. Continued

Variety or clone	Yield			Spec- ific grav- ity 1/	Tuber appearance ^{2/}			Chips	
	J's Over 3" cwt/a	A's 1-7/8" to 3" cwt/a	Total cwt/a		Surface	Shape	Eyes	Color 3/	Yield %
A6794-6	125.8	231.2	357.0	76	LtRus	Lng/Flt/Ov	Vsh	7.0	33.0
A6795-6	---	170.0	170.0	76	VLtRus	Flt/Bky	Vsh	8.0	33.4
A67100-4	47.6	173.4	221.0	91	Rus	Ov/Flt	Vsh	6.0	39.4
A67100-8	---	248.2	248.2	75	Wh/Sm	Irrg/Tk/Bky	Vsh	9.0	32.8
A67100-13	---	255.0	255.0	99	Wh/Rus	Tk/Bky	Vsh	5.0	37.0
A67102-2	---	119.0	119.0	82	Rus/2G	Irrg	P	7.0	34.4
A67104-2	---	234.6	234.6	86	Rus	Lng/Pnt/Irrg	Sh	9.0	33.2
A67107-4	42.2	180.0	222.2	86	Wh	Tk/Bky/Irrg	P	8.0	32.8
A67116-3	88.4	221.0	309.4	73	LtRus/2G	Lng/Irrg/Bky	P	9.0	34.6
A67122-7	---	272.0	272.0	87	VLtRus	Tk/Lng/Ov	Vsh	5.0	34.6
A67122-11	---	258.4	258.4	88	Rus	Ov	Vsh	5.0	34.8
A67126-2	57.8	119.0	176.8	72	VLtRus	Tk/Bky	Vsh	7.0	35.6
A67126-3	43.1	150.5	193.6	88	VLtRus	Rnd/Ov/Irrg	Vsh	5.0	38.4
A67127-5	57.8	258.4	316.2	82	Rus	Tk/Bky	Vsh	6.5	34.6
A67129-3	57.8	244.8	302.6	77	LtRus	Lng/Bky	Sh-M	8.0	32.6
A67130-2	8.7	167.7	176.4	83	Wh/SRus	Ov/Tk/Flt	Vsh	5.0	34.8
A67130-7	132.6	268.6	401.2	68	LtRus	Ov/Tk	Vsh	7.0	31.2
A67131-3	29.2	211.8	241.0	90	VLtRus	Tk/Bky/Irrg	Sh	5.0	37.6
A67131-7	60.3	277.4	337.7	89	Pink	Ov/Tk/Bky	Sh	8.0	35.4
A67133-2	54.4	238.0	292.4	75	LtRus	Lng/Tk/Flt	Vsh	8.0	33.2
A67135-1	---	183.6	183.6	96	Rus	Ov	Vsh	8.0	38.6
A67138-2	91.8	306.0	397.8	81	Rus	Lng/Ov/Bky	Vsh	8.0	31.8
A67145-4	---	139.4	139.4	50	Wh/SRus	Tk/Pnt	Vsh	6.0	38.8
A67149-1	---	210.8	210.8	82	LtRus	Ov	Vsh	7.0	36.0
A67149-2	100.8	165.4	266.2	94	Pink	Ov/Tk/Bky	Sh-M	7.5	38.8
A67151-3	---	360.4	360.4	86	Wh	Tk/Bky	Sh	7.0	33.8
A67158-5	---	309.4	309.4	96	Wh	Lng/Bky	Vsh	6.5	35.6
A67158-8	44.2	363.8	408.0	89	Rus	Ov/Tk/Irrg	D	8.5	34.6
A67168-1	---	275.4	275.4	89	LtRus	Ov/Tk/Bky	Sh	4.0	35.2
A67171-1	68.0	115.6	183.6	81	Rus	Lng/Bky	Vsh	4.0	34.8
A67171-5	---	302.6	302.6	78	Rus	Tk/Bky	Vsh	5.5	35.4
A67184-3	19.4	223.6	243.0	77	Wh/SRus	Bky/Flt	M	6.0	34.6
A67284-2	---	132.6	132.6	70	Rus	Ov/Pnt	Vsh	7.5	33.4
A67284-5	125.8	255.0	380.8	90	Rus	Tk/Bky/Irrg	Vsh	5.5	33.4
A67284-6	171.2	143.4	314.6	96	Rus/Le	Bky/Flt/Tk	Vsh	7.0	42.4
A67303-3	91.8	285.6	377.4	68	Rus/GC	Tk/Bky	M	7.0	35.6
A67306-5	11.8	184.7	196.5	84	Rus	Ov/Flt/Unif	Sh	7.0	34.8
A67315-1	---	171.7	171.7	--	Wh/SRus	Ov/Tk/Flt	Vsh	5.5	34.8
A67315-3	19.5	167.2	186.7	82	LtRus	Rnd/Tk	Vsh	8.0	36.2
A67315-6	32.3	274.7	307.0	92	Rus	Lng/Tk/Bky	Sh-P	7.0	39.2
A67315-7	---	268.2	268.2	94	Tan/Rus	Ov/Tk	Sh	7.0	39.8
A67321-1	---	435.2	435.2	89	LtRus	Tk/Bky	Vsh	6.0	34.4
A67325-4	100.7	199.4	300.1	88	Wh	Ov/Tk/Bky	M	4.0	40.2
A67325-7	---	83.2	83.2	88	Rus	Lng/Ov/Flt	Sh	7.0	35.6
A67328-1	44.8	133.3	178.1	81	Wh/SRus	Lng/Rnd/Tk	Vsh	8.0	33.4

Arizona Table 2. Continued

Variety or clone	Yield		Total	Spec- ific grav- ity 1/	Tuber appearance2/			Chips	
	J's	A's			Surface	Shape	Eyes	Color	Yield
	Over 3" cwt/a	1-7/8" to 3" cwt/a							
A67328-2	---	289.0	289.0	80	LtRus/2G	Lng/Tk/Bky	Vsh-P	8.0	32.6
A67328-3	---	152.0	152.0	90	LtRus	Ov	Sh	7.0	36.8
A67340-1	176.8	214.2	391.0	80	LtRus	Lng/Tk/Bky	D	6.0	32.8
A67340-3	154.0	213.4	367.4	75	Wh/Flt	Lng/Tk/Bky	Vsh	8.0	31.8
A67341-2A	---	238.0	238.0	68	LtRus	Lng/FltBky	Vsh	8.0	32.2
A67341-3	2.0	105.5	107.5	76	Rus	Ov/Tk/Bky	M	9.0	31.6
A67341-4	108.8	391.0	499.8	83	Rus	Lng/Pnt/Flt	Vsh	6.5	34.6
A67341-6	---	216.8	216.8	85	LtRus	Tk/Bky	M	6.0	40.0
A67341-7	193.8	200.6	394.4	76	VLtRus	Lng/Tk/Flt	Vsh-P	6.0	32.4
A67341-8	68.5	173.2	241.7	81	Rus	Lng/Tk/Bky	Vsh	8.0	33.0
A67341-9A	---	595.0	595.0	79	Rus	Tk/Ov	Sh-M	7.0	33.9
A67341-16	---	275.4	275.4	81	Tan/Rus	Lng/Tk/Pnt	Vsh	5.0	34.4
A67352-1	113.1	54.5	167.6	82	Pink	Tk/Ov	M	8.0	33.6
A67352-2	206.0	212.1	418.1	82	Tan-Pink	Tk/Bky	M	8.0	33.1
A67357-1	219.0	102.0	321.0	79	Pink	Lng/Bky	M	7.0	34.4
A67358-1	88.4	506.6	595.0	69	Red/Rus	Lng/Ov/Bky	Vsh	7.0	36.2
A67358-3	83.5	209.7	293.2	82	VLtRus	Lng/Ov	Vsh	6.0	34.8
A67358-6	95.7	171.1	266.8	80	Tan-Pink	Bky	Sh	7.0	32.4
A67358-9	251.6	319.6	571.2	73	VLtRus	Rnd/Tk/Bky	Vsh	7.0	34.0
A67358-13	81.6	278.4	360.0	89	LtRus	Tk/Bky	Vsh	7.0	37.2
A67358-15	289.0	612.0	901.0	70	Orng-Pink	Lng/Tk/Bky	Vsh	7.0	32.4
A67358-18	302.6	333.2	636.8	80	Red/Rus	Lng/Bky/Ov	Sh-M	7.0	33.7
A67358-20	8.8	316.8	325.6	90	LtRus	Tk/Bky	Vsh	5.0	36.6
A67358-21	106.7	211.6	318.3	80	Pink/Rus	Ov	Vsh	6.0	34.8
A67366-6	---	156.4	156.4	79	VLtRus	Ov/Pnt	Vsh	8.0	33.2
A67366-7	119.0	336.6	455.6	84	VLtRus	Tk/Bky/Ov	Vsh	6.0	35.0
A67368-5	---	401.2	401.2	86	Rus	Lng/Bky	Vsh	7.0	36.2
A67369-8	57.8	404.6	462.4	100	Rus	Lng/Tk/Pnt	Vsh	7.0	38.2
A67369-10	57.8	431.8	489.6	88	Wh/SRus	Lng/Bky/Irrg	Vsh	9.0	36.4
A67373-8	---	411.4	411.4	80	LtRus	Lng/Ov/Tk	Vsh	7.0	33.0
A67373-11	52.1	216.7	268.8	88	VLtRus	Lng/Tk/Bky	Vsh	6.0	37.0
A67373-16A	149.6	408.0	557.6	85	LtRus	Lng/Tk/Bky	Vsh	8.0	34.8
A67373-17	---	448.8	448.8	89	Rus	Lng/Tk/Bky	Vsh	8.5	34.0
A67381-3	114.5	167.0	281.5	91	Wh/SRus	Flt/Tk/Bky	Vsh	6.0	37.8
A67381-4	139.4	510.0	649.4	79	VLtRus	Tk/Bky	Vsh	5.5	33.2
A67385-3	---	367.2	367.2	77	Rus	Tk/Ov	D	5.5	35.0
A67385-7	74.6	227.5	302.1	82	Wh/SRus	Lng/Tk/Bky	Sh	5.0	39.2
A67387-1	72.8	221.0	293.8	85	LtRus	Tk/Bky	Sh	7.0	35.4
A67404-1	95.2	340.0	435.2	89	Wh/SRus	Lng/Tk/Bky	Vsh	6.0	35.2
A67488-2	321.6	125.8	447.4	84	LtRus	Ov/Flt	Sh	7.0	34.4
A67488-4	95.2	268.6	363.8	69	Wh/SRus	Tk/Bky/Lng	Vsh	7.0	34.2
A67490-1	57.8	210.8	268.6	77	VLtRus	Ov	Sh	9.0	32.0
A67490-2	149.6	326.4	476.0	83	Rus	Ov/Tk	Vsh	7.0	39.0
A67491-1	8.6	259.4	268.0	92	Tan/Rus	Lng/Tk/Bky	Sh	7.0	38.4

Arizona Table 2. Continued

Variety or clone	Yield		Total	Spec- ific grav- ity 1/	Tuber appearance2/			Chips	
	J's Over 3" cwt/a	A's 1-7/8" to 3" cwt/a			Surface	Shape	Eyes	Color 3/	Yield %
A67505-1	179.1	168.4	347.5	82	Wh/SRus	Rnd/Ov/Irrg	M	4.0	33.2
A68297-5	68.0	312.8	380.8	79	Wh/Rus	Lng/Tk/Bky	Sh	6.0	32.4
A68628-6	---	452.2	452.2	73	Wh/Rus	Flt/Lng	Vsh	6.0	32.4
A68629-4	---	357.0	357.0	63	Wh	Ov/Flt	Vsh	8.0	30.0
A68637-2	57.8	550.8	608.6	85	VLtRus	Tk/Pnt	Vsh	7.0	34.2
A68637-3	88.4	329.8	418.2	69	Wh/Sm	Tk/Bky	Vsh	7.0	34.0
A68637-5	---	414.8	414.8	91	VLtRus	Tk/Ov	Vsh	6.0	36.2
A68637-8	10.9	290.2	301.1	89	Wh/Sm/Le	Ov/Bky	Vsh	5.0	38.6
A68637-9	115.2	181.8	297.0	83	Wh/SRus	Rnd/Tk	D	6.0	35.8
A68637-10	88.4	157.7	246.1	70	Wh	Rnd/Tk/Unif	Sh	5.5	30.4
A68637-12	---	105.4	105.4	82	LtRus	Ov	Vsh	9.5	34.2
A68637-16	---	409.0	409.0	88	Wh/Sm	Ov/Tk	Vsh	5.0	36.4
A68641-14	177.0	160.2	337.2	97	Wh/SRus	Tk/Bky	Sh	7.0	35.0
A68641-15	---	445.4	445.4	57	Wh	Lng/Pnt	Vsh	7.0	34.0
A68681-3	---	190.4	190.4	75	Rus	Ov	Vsh	6.0	33.2
A68715-1	---	380.8	380.8	86	Wh	Pnt/Ov	M	6.0	37.6
A68718-1	163.2	323.0	486.2	87	Rus	Tk/Bky	D	8.0	35.0
A68718-3	68.0	329.8	397.8	87	Rus	Lng/Tk	D	7.0	35.8
A68719-2	---	384.2	384.2	86	Wh/SRus	Tk/Ov	Sh	7.0	34.2
A68721-1	129.2	418.2	547.4	82	Wh/SRus	Tk/Bky/Ov	Vsh	7.5	35.0
A68721-2	---	544.0	544.0	81	LtRus/GC	Lng/Pnt/Tk	Vsh	5.5	33.0
A68730-1	---	289.0	289.0	80	LtRus/GC/2G	Irrg/Tk/Pnt	M-P	7.0	34.2
A68730-3	14.8	101.9	116.7	85	LtRus	Tk/Bky	Vsh	10.0	38.8
A68730-4	78.2	391.0	469.2	89	Rus/GC	Lng/Pnt/Irrg	Vsh-P	8.0	34.4
A68730-6	---	353.6	353.6	94	Rus	Ov/Flt	Vsh	5.5	36.6
A68730-7	---	275.4	275.4	94	Tan/Rus	Lng/Pnt/Ov	Vsh	6.0	36.4
NDA8451-3	---	221.0	221.0	75	Rus	Tk/Bky	Sh	6.0	33.6
NDA8452-4	85.8	199.6	285.4	79	Wh/SRus	Ov/Tk/Irrg	Sh	8.0	33.0
NDA8452-5	46.1	172.5	218.6	79	Wh/SRus	Lng/Tk/Pnt	D	8.0	32.6
NDA8453-1	140.6	184.4	325.0	77	Wh/Rus	Ov/Tk/Bky	Sh	8.5	34.8
NDA8453-2	170.0	140.1	310.1	77	Tan/Rus	Tk/Bky/Irrg	M	6.5	34.6
NDA8462-1	---	131.1	131.1	90	LtRus	Ov/Tk	Vsh	6.0	37.2
NDA8462-2	10.0	154.1	164.1	86	Rus	Lng/Flt/Bky	Vsh	6.0	35.2
NDA8501-6	---	261.8	261.8	78	VLtRus	Tk/Bky	Vsh	7.0	33.6
NDA8505-6	---	384.2	384.2	88	Wh/SRus/Le	Tk/Bky/Flt	Vsh	6.0	34.2
NDA8572-2	---	340.0	340.0	70	Rus	Tk/Bky	Vsh	5.0	32.2
NDA8635-3	---	323.0	323.0	68	Wh/SRus	Tk/Bky/Flt	Vsh	7.0	29.0
NDA8636-3	---	418.2	418.2	99	Rus/2G	Ov	Sh	5.0	35.6
NDA8676-7	88.4	244.8	333.2	81	Wh/SRus	Lng/Ov	Vsh	8.0	33.0
PI195191-1	183.6	119.0	302.6	70	Wh/Rus	Lng/Tk/Bky	Vsh	8.0	32.0
PI195191-1A	---	268.6	268.6	81	Wh/GC	Tk/Bky/Irrg	M	7.5	32.5

See footnotes of Arizona Table 1.2/ Additional tuber appearance abbreviations:
 2G - secondary growth, 2T - secondary tubers, GC - growth cracks, Sm - smooth,
 Lt - light, Le - lenticils, Orng - Orange, Pnt - pointed, P - protruding.

Arizona Table 3. Yield, specific gravity, tuber appearance, chip color and yield of C₂ potato clones grown at Queen Creek and Mesa, Arizona--1971 (5-hill plots)

Variety or clone	Yield			Spec- ific grav- ity 1/	Tuber appearance ^{2/}			Chips	
	J's Over 3" cwt/a	A's 1-7/8" to 3" cwt/a	Total cwt/a		Surface	Shape	Eyes	Color	Yield
								3/	%
A59310-2(166-2)	58.7	444.1	502.8	77	Wh/Rus	Tk/Pnt	Vsh	4.0	32.0
A59318-3(166-3)	---	339.4	339.4	75	VLtRus	Bky/Tk	Vsh	4.0	32.8
A59315-6(166-6)	---	398.0	398.0	76	VLtRus	Bky/Irrg	Sh	7.0	30.2
A6123-4(169-4)	---	255.6	255.6	68	Rus	Ov	Sh	6.0	35.4
A6123-5(169-5)	---	67.0	67.0	80	Rus	Pnt/Ov	Sh	4.0	33.8
A67440-9(118-9)	---	440.0	440.0	74	Wh/Rus	Tk/Bky	Sh-M	5.0	35.8
A67467-4(120-4)	---	171.8	171.8	66	Rus	Rnd	D	4.0	31.4
A67467-6(120-6)	---	414.8	414.8	82	Wh/Rus/2G	Lng/Pnt	Sh-M	4.0	37.2
A67467-7(120-7)	---	315.0	315.0	70	VLtRus/GC	Tk/Bky/Irrg	Sh-M	5.0	32.2
A67467-9(120-9)	---	196.9	196.9	65	VLtRus	Tk/Bky/Rnd	Sh	4.0	34.4
A67475-1(121-1)	---	272.4	272.4	69	Wh/Rus	Tk/Bky/Irrg	Sh-M	7.0	33.2
A6802-2(172-2)	---	289.1	289.1	66	Rus/GC	Lng	Sh	8.0	30.8
A6805-1(6-1) 5/	---	217.9	217.9	70	LtRus	Tk/Bky/Rnd	Sh	6.0	33.4
A6805-1(174-1)	---	104.8	104.8	68	Wh/Rus	Rnd/Irrg	M	3.0	33.2
A6811-3(8-3)	---	297.5	297.5	69	Rus/2G	Irrg/Flt/Tk	Sh	6.0	34.0
A6812-1(9-1)	---	314.2	314.2	70	LtRus/DkRus	Tk/Pnt/Ov	M	6.0	31.6
A6817-1(10-1)	---	326.8	326.8	63	Rus/Le	Tk/Ov/Unif	Vsh	7.0	30.3
A6823-5(12-5)	---	92.2	92.2	82	Rus	Ov	Sh	4.5	34.2
A6833-1(18-1)	---	257.7	257.7	74	LtRus	Bky/Pnt/Irrg	Sh	7.5	33.1
A6837-1(22-1)	---	456.7	456.7	66	Wh/Rus	Lng/Tk/Pnt	Sh	6.5	31.6
A6839-4(22-4)	---	62.8	62.8	80	VLtRus	Small/Bky	Vsh	5.0	35.0
A6850-3(24-3)	---	339.4	339.4	75	Rus	Tk/Bky	Sh	5.0	33.6
A6873-2(N29-2)	---	343.6	343.6	66	Wh/Rus/Le	Pnt/Tk	Sh	7.0	32.6
A6874-7(C7-7)	---	146.6	146.6	75	Rus	Tk/Bky	M	4.0	34.6
A68113-11(C9-11)	---	314.2	314.2	78	Rus	Ov	Sh	6.0	33.6
A68117-1(C10-1)	---	326.8	326.8	75	Rus	Pnt/Ov	Sh	6.0	34.2
A68117-6(C10-6)	---	305.9	305.9	78	Rus	Ov	Sh	7.0	31.4
A68119-4(C11-4)	---	326.8	326.8	68	LtRus/2G	Tk/Bky	Sh	7.0	32.4
A68119-14(C11-14)	---	176.0	176.0	72	Rus	Ov	Vsh	4.0	33.4
A68154-1(C16-1)	46.1	213.7	259.8	67	Rus	Tk/Bky	Sh-M	4.0	32.0
A68217-1(46-1)	217.9	92.2	310.1	50	Rus/2G	Lng/Tk/Bky	Sh-P	7.5	27.6
A68220-1(48-1)	---	385.5	385.5	60	Rus	Tk/Bky	Sh	5.0	31.2
A68233-1(206-1)	52.5	204.8	257.3	58	Wh/Rus/2G	Lng/Tk/Bky	Sh	7.0	30.8
A68233-4(206-4)	---	52.5	52.5	57	Wh/Rus	Ov	Vsh	4.0	31.4
A68237-5(207-5)	105.0	273.0	378.0	60	VLtRus/2G	Tk/Bky	Sh-P	7.0	30.6
A68241-2(208-2)	---	413.0	413.0	75	Wh/Rus/2G	Lng/Ov/Irrg	Sh	4.0	33.4
A68241-5(208-5)	---	630.0	630.0	69	Wh	Tk/Bky	Sh-P	7.0	33.0
A68243-1(209-1)	---	392.0	392.0	68	Rus	Tk/Bky	Sh	7.0	33.0
A68247-2(55-2) 5/	---	243.0	243.0	82	Rus	Bky/Pnt/Ov	Sh-M	6.0	37.2
A68247-2(210-2)	---	273.0	273.0	73	LtRus	Ov	Sh	6.0	34.2
A68247-3(210-3)	---	301.7	301.7	68	LtRus/Le	Ov	Sh-P	6.0	31.6
A68250-4(57-4)	---	456.7	456.7	73	LtRus	Rnd/Tk/Unif	Sh	7.0	34.6
A68254-4(213-4)	---	287.0	287.0	83	LtRus	Tk/Ov	Sh	5.0	37.4
A68254-6(213-6)	---	198.9	198.9	80	LtRus	Ov/Unif	Sh	7.0	34.4

Arizona Table 3. Continued

Variety or clone	Yield			Spec- ific grav- ity 1/	Tuber appearance ^{2/}			Chips	
	J's Over 3" cwt/a	A's 1-7/8" to 3" cwt/a	Total cwt/a		Surface	Shape	Eyes	Color	Yield 3/ %
A68254-7(213-7)	---	440.0	440.0	78	VLtRus/Le	Tk/Pnt/Ov	M-D	7.0	35.4
A68254-8(213-8)	---	381.3	381.3	87	VLtRus	Tk/Bky	Sh-M	5.0	36.0
A68254-9(213-9)	---	393.9	393.9	81	Rus/GC	Ov/Pnt	Sh	4.0	35.8
A68257-1(59-1) 5/	---	150.8	150.8	74	Rus	Lng/Ov/Unif	Vsh	6.0	36.2
A68257-1(214-1) 5/	---	77.0	77.0	102	Rus	Tk/Bky	Sh	2.0	38.8
A68257-2(59-2) 5/	---	326.8	326.8	81	Rus	Tk/Bky	M	5.0	36.0
A68257-2(214-2) 5/	---	335.0	335.0	59	Rus/Le	Lng/Bky	Sh	9.0	30.2
A68257-3(214-3)	---	364.0	364.0	74	Rus	Ov	Sh	3.5	33.0
A68257-6(214-6)	---	50.3	50.3	95	Rus	Ov	Sh	4.0	38.8
A68258-1(60-1)	---	368.7	368.7	32	Rus	Lng/Flt/Ov	Sh-M	9.0	35.4
A68258-4(60-4)	---	356.2	356.2	71	Rus	Lng/Tk/Unif	Sh-M	9.0	35.2
A68261-2(62-2)	---	293.3	293.3	71	Rus	Tk/Rnd/Ov	Sh	5.0	34.8
A68277-5(65-5)	---	419.0	419.0	74	Rus	Lng/Tk/Bky	D	7.0	33.2
A68277-6(65-6)	79.6	167.6	247.2	60	Rus/2G	Lng/Tk/Bky	Sh	8.0	31.0
A68294-5(137-5)	---	310.1	310.1	64	Rus	Tk/Bky	Sh	7.0	32.4
A68294-6(137-6)	---	289.1	289.1	68	Rus	Tk/Bky	Sh	5.0	35.2
A68313-1(223-1)	---	105.0	105.0	108	Rus	Ov	Sh	8.0	31.0
A68586-6(140-6)	159.2	385.5	544.7	67	LtRus/2G	Tk/Bky	Sh-M	5.5	34.0
A68586-7(140-7)	---	155.0	155.0	75	Rus	Pnt/Ov/Tk	Sh	4.0	32.8
A68588-8(142-8)	142.5	238.8	381.3	67	VLtRus	Tk/Bky/Irrg	Sh	4.5	35.0
A68588-13(142-13)	---	360.3	360.3	71	Rus	Tk/Ov/Unif	Vsh	5.5	32.6
A68590-10(144-10)	---	284.9	284.9	77	Rus	Lng/Ov/Unif	Sh	8.0	35.0
A68590-16(144-16)	46.1	331.0	377.1	75	LtRus	Ov/Tk	Vsh	9.0	33.4
A68590-19(144-19)	---	268.2	268.2	75	LtRus	Ov	Sh	5.5	33.2
A68592-1(227-1)	---	138.3	138.3	46	LtRus	Ov/Irrg	Sh	10.0	24.4
A68595-3(230-3)	---	345.5	345.5	60	Rus	Pnt/Lng/Irrg	M	7.0	31.8
A68599-1(80-1)	---	259.8	259.8	82	Rus	Tk/Ov/Unif	Sh	4.5	34.4
A68614-1(238-1)	205.3	205.3	410.6	67	VLtRus	Lng/Ov	Sh-M	7.0	29.8
A68617-1(240-1)	---	371.0	371.0	69	Rus	Ov	Sh	5.0	34.0
A68618-1(241-1)	---	220.5	220.5	74	Wh/Rus	Pnt/Ov	Sh	4.0	32.2
A68618-3(241-3)	---	335.0	335.0	88	Rus	Ov	Sh	4.0	36.8
A68619-2(242-2)	---	378.0	378.0	70	Wh/Rus	Lng/Ov	Sh	7.0	30.6
A68623-2(246-2)	---	378.0	378.0	67	LtRus	Tk/Bky	Sh	7.0	30.8
A68624-1(247-1)	---	429.3	429.3	76	Wh/Rus	Ov	Sh	6.0	31.6
A68625-2(248-2)	50.3	314.2	364.5	71	LtRus	Tk/Bky	Sh	5.0	32.6
A68632-1(82-1)	---	234.6	234.6	72	VLtRus	Irrg/Ov/Pnt	Sh	4.0	33.8
A68634-1(253-1)	---	366.4	366.4	69	Rus	Ov	Sh	5.0	32.4
A68634-6(253-6)	---	567.0	567.0	60	LtRus	Lng	Sh	5.5	30.8
A68643-2(258-2)	---	397.9	397.9	83	Wh/Rus/2G	Lng/Pnt/Irrg	Sh-P	6.0	37.0
A68643-3(258-3)	---	343.0	343.0	68	Wh/Rus	Irrg/Tk/Bky	Sh-P	7.0	34.0

Arizona Table 3. Continued

Variety or clone	Yield			Spec- ific grav- ity <u>1/</u>	Tuber appearance ^{2/}			Chips	
	J's Over 3" cwt/a	A's 1-7/8" to 3" cwt/a	Total cwt/a		Surface	Shape	Eyes	Color	Yield
								<u>3/</u>	%
A68645-1(259-1)	---	502.6	502.6	82	Wh/Rus	Tk/Ov/Unif	Sh	5.0	37.2
A68645-4(259-4)	93.0	252.0	350.0	82	VLtRus	Tk/Bky	M	5.0	36.4
A68645-5(259-5)	---	553.0	553.0	69	Wh/Rus	Tk/Bky/Irrg	Sh	5.0	33.1
A68645-6(259-6)	---	418.8	418.8	71	Wh/Rus	Lng/Tk/Pnt	Sh	8.0	35.0
A68647-1(261-1)	---	371.0	371.0	68	VLtRus	Tk/Ov	M	7.5	32.8
A68648-1(86-1)5/	---	293.3	293.3	73	Wh/Rus	Lng/Pnt	Sh	4.0	37.8
A68648-1(262-1)	---	224.0	224.0	78	Wh/Rus	Lng	Sh	4.0	37.8
A68653-2(264-2)	---	161.0	161.0	62	Wh/Rus/2G	Tk/Ov	Sh	6.0	30.4
A68653-4(264-4)	---	230.3	230.3	69	VLtRus	Tk/Ov	M	4.0	34.4
A68659-1(268-1)	---	553.0	553.0	73	LtRus/2T	Rnd	Sh	6.0	32.8
A68659-3(268-3)	---	240.8	240.8	69	Rus	Rnd	Sh	7.5	34.0
A68660-4(269-4)	---	497.0	497.0	78	VLtRus	Bky	Sh	6.0	35.8
A68667-2(145-2)	---	305.9	305.9	68	VLtRus	Tk/Rnd/Ov	Sh	7.0	33.0
A68672-1(273-1)	149.6	367.2	516.8	80	Wh/SRus	Tk/Bky	Sh	5.0	34.2
A68681-2(94-2)	---	217.9	217.9	86	Rus	Bky	Sh	6.0	36.6
A68681-6(277-6)	176.8	119.0	295.8	63	Wh/SRus/2G	Tk/Bky/Irrg	Vsh	8.0	33.8
A68683-14(96-14)	---	310.0	310.0	72	VLtRus	Pnt/Ov	Sh	7.0	35.0
A68684-1(280-1)	---	268.6	268.6	93	Rus	Tk/Pnt	Vsh	4.0	34.0
A68684-2(280-2)	54.4	180.2	234.6	94	LtRus	Lng/Flt	Vsh	5.5	36.0
A68684-4(280-4)	---	221.0	221.0	89	Wh/SRus	Flt/Bky	Sh	7.0	32.4
A68689-4(143-4)	---	272.4	272.4	65	Rus	Lng/Tk/Bky	Vsh	6.0	32.4
A68704-1(287-1)	112.2	214.2	326.4	88	Wh	Lng/Pnt	Vsh-P	5.0	37.4
A68709-1(289-1)	34.0	278.8	312.8	77	Wh/Rus	Rnd/Tk/Irrg	M	8.0	30.2
A68709-8(289-8)	54.4	255.0	309.4	69	Wh/Rus	Tk/Bky/Flt	M	6.0	34.0
A68712-1(292-1)	---	421.6	421.6	81	LtRus	Bky/Flt	D	6.0	35.0
A68715-10(295-10)	64.6	265.2	329.8	88	Wh	Ov/Lng	M	6.0	38.2
A68719-4(297-4)	85.0	197.2	282.2	92	Wh	Tk/Bky/Flt	D	5.0	37.8
A68720-3(113-3)	---	322.6	322.6	57	Rus	Lng/Pnt	Sh	7.0	30.8
A68720-7(298-7)	---	282.2	282.2	88	Rus	Lng/Ov	Vsh-P	6.5	35.2
A68722-6(299-6)	---	---	---	85	Wh	Lng/Pnt	Sh	6.0	36.0
A69669-3(301-3)	---	340.0	340.0	94	LtRus	Tk/Bky	D	6.5	37.4
A69870-2(303-2)	51.0	146.2	197.2	93	Wh	Lng/Tk/Pnt	Vsh	7.0	36.8
NDA8799-2(N12-2)	46.1	347.8	393.9	62	Rus	Lng/Pnt	M	9.0	30.6
NDA8842-1(N22-1)	58.7	213.7	272.4	71	Wh/Rus	Tk/Bky	Sh	7.0	32.6
NDA8856-1(N24-1)	---	347.8	347.8	77	Wh/SRus	Tk/Ov	Sh	4.0	33.4

See footnotes of Table 1.

5/ Certain pedigree numbers which appear to be duplicates are expected to be changed prior to the 1972 crop season.

Arizona Table 4. Yield, specific gravity, chip color and yield of selected varieties grown for total glycoalkaloid content evaluation in cooperation with the USDA at Mesa, Arizona--1971. (10-hill plots replicated four times)

Variety or clone	Yield			Spec- ific grav- ity <u>1/</u>	Chips	
	J's Over 3" cwt/a	A's 1-7/8" to 3" cwt/a	Total cwt/a		Color <u>3/</u>	Yield %
Katahdin	32.6	296.1	328.7	67	5.4	31.4
Kennebec	111.8	292.9	404.7	75	4.2	32.6
B5141-6	11.6	320.2	331.8	86	3.6	35.0
Russet Burbank	---	231.0	231.0	71	6.0	32.3

See footnotes of Arizona Table 1.

CALIFORNIA

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Variety and Advanced Selection Trials

Eleven varieties and five advanced seedlings were evaluated at two locations in 1971. These were the USDA Cotton Research Station near Shafter in Kern County and at the Tulalake Field Station in Modoc-Siskiyou Counties. Duplicate seed sources were used for many of the varieties. In addition to Idaho and California grown seed potatoes, some varieties were evaluated from Maine grown seed potatoes. Virus "X-free" sources of two varieties, Kennebec and White Rose, were also evaluated. The three seed sources, California (Tulalake), Idaho (Aberdeen), and Maine (Presque Isle) were all of similar age - approximately May planting and September harvest. The Chieftain variety was grown from a mid-summer planting and January harvest in the Stockton Delta area of California.

Kern County Trial. Table 1 lists some of the yield and quality measurements from the Shafter trial. Cascade yielded the highest as it frequently has in California trials. The number of tubers set is large and the percent that size into No. 1's is also large. Resistance to acceptance of this variety has come from the potato chip industry. Chipping qualities and percent solids are slightly inferior to Kennebec. Norchip tubers were small resulting in low yields. Norchief also set heavy which resulted in a high percentage of B-size. A wider spacing would help this variety. Russet Burbank, as usual, did not produce any size in this area. White Rose, the standard in this area with Kennebec, was not outyielded significantly by any variety. Line B5267-2 looked satisfactory but is not superior to the Kennebec. Line B6044-14 yielded well and looked excellent when dug. It subsequently shattered very badly, however. The three lines from Idaho, all russets, did not receive a fair trial because they were planted five weeks later than the other varieties. The high July temperatures did not permit a corresponding later harvest.

The specific gravity was higher than average for most varieties because of the cool spring. Thus, most varieties were 0.010 higher than in 1970. With the exception of Norgold Russet and Red La Soda all varieties produced satisfactory potato chips. These chips were made the day following harvest. No storage and reconditioning data was obtained.

Variation among seed sources was inconsistent. However, the X-free Kennebec was obviously more vigorous than the other two sources. This line would have continued to accumulate dry matter beyond the harvest date. The White Rose X-free source was not superior to the non X-free Idaho source.

Tulalake Trial. Table 2 lists yield and quality measurements. The early and intermediate maturing varieties yielded high in 1971 but the late maturing varieties did not. The late spring, in combination with early freeze, resulted in a shortened growing season. The chipping varieties yielded high but the specific gravity was low. In 1971 the specific gravity was higher in Kern County than Tulalake. The two USDA lines from Maine, B5267-2 and B6044-14, yielded satisfactorily but not as high as Kennebec. Line B6044-14 shattered badly again.

The chip color was not uniformly acceptable at Tulelake. Tuber pulp temperatures were approximately 50° F and had been subjected to lower temperatures than that before harvest and chipping. As a result, Cascade, Chieftain, Russet Burbank, White Rose, B6044-14, A6371-2 and A63126-2 were inferior to Kennebec, Monona, Norchip, Wauseon, B5267-2 and A6371-3.

As in Kern County no consistent differences between seed sources were evident. Also, the X-free sources were not superior; however, the vigor of the X-free Kennebec was evident during the growing season.

New Seedlings

Twenty five seedlings from the USDA breeding program at Beltsville and Maine were grown in Kern County. These seedlings plus 31 from Idaho were grown at Tulelake. Since a primary objective is to find superior russet types, nearly all seedlings tested were russets. Tables 3 and 4 list yield (number and weight), number of hills, specific gravity, and for a few lines, chip color. Table 5 lists the top lines in each of several factors including appearance acceptability.

Many of the seedlings had general acceptability at both locations. These included B7147-1, B7147-17, B7147-36, B7196-40, B7196-56, B7196-64, and B7200-6. Among the seedlings not grown at Shafter but with favorable acceptability at Tulelake included A477-8, A483-6, A503-42, A6334-19, A64187-4, A6698-2, A66107-98, A66107-180, A66122-3, and NDA7938-3. Of these, however, A6334-19, A64187-4, A66107-98, and A66107-180 chipped very dark. Soil and tuber temperatures had been below 50° F for several days before harvest and chipping. Seedling A503-42, the top yielder, also had excellent specific gravity and chip color and appears to have good processing potential. Seedling B7196-40 was not a high yielder at either location but had excellent net, shape and size for fresh market. The specific gravity was 1.100 at Shafter and chipped satisfactorily. The specific gravity and chip color was less satisfactory at Tulelake. Seedling B7147-1 also showed good potential for fresh and processing markets.

Many of these seedlings will be grown in larger quantity and in more locations in 1972.

California Table 1. Yield and quality measurements of varieties and advanced seedlings grown in Kern County--1971

Variety	Source	Yield			Avg Tuber Wt (oz) No. 1's	Specific Gravity	Chip ^{1/} Color
		Total Cwt./A	No. 1's Cwt./A	% No. 1's			
Cascade	California	520	455	88	5.7	1.082	4
Cascade	Maine	455	385	85	6.8	1.084	5
Chieftain	California ^{2/}	365	280	77	6.4	1.081	4
Kennebec	California	405	350	86	7.0	1.085	4
Kennebec	Idaho	340	300	88	7.4	1.085	4
Kennebec	Idaho-Xfree	420	380	90	8.1	1.090	4
Monona	California	360	310	86	8.3	1.074	4
Monona	Idaho	370	305	82	6.5	1.077	4
Norchief	Maine	380	265	70	5.6	1.077	5
Norchip	California	280	170	61	5.4	1.075	4
Norchip	Idaho	305	200	66	4.9	1.079	4
Norchip	Maine	300	175	58	4.7	1.081	4
Norgold Russet	California	255	185	73	5.9	1.074	8
Norgold Russet	Idaho	350	250	71	5.7	1.079	7
Red LaSoda	California	330	230	70	6.1	1.074	6
Red LaSoda	Idaho	410	300	73	6.4	1.079	6
Russet Burbank	California	170	70	42	4.9	1.086	5
Wauseon	Maine	370	285	76	6.0	1.078	4
White Rose	California	345	280	81	6.9	1.082	5
White Rose	Idaho	445	345	78	6.5	1.082	5
White Rose	Idaho-Xfree	440	340	77	6.8	1.086	5
B5267-2	Maine	405	350	86	7.0	1.082	4
B6044-14	Maine	350	295	84	5.4	1.088	5
A6371-2	Idaho	325	210	65	4.8	1.081	5
A6371-3	Idaho	240	150	63	4.8	1.085	5
A63126-2	Idaho	330	215	65	4.6	1.085	5

^{1/} Chip color based on NPCI scale (1 = excellent)

^{2/} Stockton Delta Seed

No. 1 Grade = Greater than 1-7/8" diameter

Planting Dates: Shafter February 11 (last 3 planted on March 19), Tulelake May 12

Harvest Dates: Shafter June 28 (all varieties), Tulelake September 28

Plant Population: 9" spacing in 36" rows equals approximately 17,500 plants/acre

Plot Size: 4 reps, each 25' x 3'

California Table 2. Yield and quality measurements of varieties and advanced seedlings grown at Tulelake--1971

Variety	Source	Yield			Avg Tuber Wt (Oz) No.1's	Specific Gravity	Chip ^{1/} Color
		Total Cwt/A	No. 1's Cwt/A	% No.1's			
Cascade	California	380	330	86	8.0	1.070	7
Cascade	Maine	455	390	86	8.1	1.070	7
Chieftain	California ^{2/}	400	350	87	5.4	1.071	6
Kennebec	California	435	370	85	7.9	1.077	4
Kennebec	Idaho	440	340	78	8.2	1.075	5
Kennebec	Idaho-Xfree	425	355	84	10.1	1.072	4
Monona	California	400	350	87	6.8	1.070	4
Monona	Idaho	400	350	88	7.3	1.070	4
Norchief	Maine	350	285	82	5.1	1.072	9
Norchip	California	340	285	84	4.7	1.076	5
Norchip	Idaho	390	340	87	4.9	1.077	4
Norchip	Maine	370	320	86	4.9	1.078	5
Norgold Russet	California	240	210	88	6.9	1.072	9
Norgold Russet	Idaho	290	235	82	5.9	1.073	9
Red LaSoda	California	460	420	91	8.1	1.072	8
Red LaSoda	Idaho	465	400	86	8.3	1.074	8
Russet Burbank	California	350	250	72	5.6	1.080	6
Wauseon	Maine	405	350	87	8.3	1.074	4
White Rose	California	280	215	75	7.2	1.068	7
White Rose	Idaho	350	265	75	8.2	1.067	7
White Rose	Idaho-Xfree	330	220	67	8.3	1.068	7
B5267-2	Maine	395	345	88	5.7	1.076	5
B6044-14	Maine	405	350	87	7.2	1.078	7
A6371-2	Idaho	262	185	70	5.1	1.087	6
A6371-3	Idaho	270	220	82	6.1	1.082	5
A63126-2	Idaho	260	185	71	5.8	1.084	8

^{1/} Chip color based on NPCI scale (1 = excellent)

^{2/} Stockton Delta Seed

No. 1 Grade = Greater than 1-7/8" diameter

Planting Dates: Shafter February 11 (last 3 planted on March 19), Tulelake May 12

Harvest Dates: Shafter June 28 (all varieties), Tulelake September 28

Plant Population: 9" spacing in 36" rows equals approximately 17,500 plants/acre

Plot Size: 4 reps, each 25' x 3'

California Table 3. Yield and quality measurements of new seedlings grown in Kern County, 1971

Seedling	No. of Hills	Total		Yield		% No. 1's		Specific Gravity	Chip ^{1/} Color
		No.	Wt.(lbs)	No.	Wt.(lbs)	No.	Wt.(lbs)		
B7147-1	5	6.0	1.3	1.4	0.4	23	35	1.087	6
-17	6	4.0	1.2	1.0	0.5	25	41	1.076	8
-28	5	3.8	1.0	2.4	0.7	63	70	1.091	
-31	3	6.0	2.5	2.7	1.5	44	60	1.081	
-36	4	7.8	2.9	3.5	1.8	45	61	1.082	4
-37	6	7.7	1.6	1.5	0.6	20	36	1.078	6
-73	3	10.7	3.3	2.3	1.2	22	35	1.073	
-83	6	4.2	1.3	1.7	0.7	40	53	1.080	
B7159-26	12	5.8	0.9	0.2	0.1	4	11	1.088	
B7160-1	7	2.6	0.9	1.3	0.6	50	68	1.077	
B7187-1	6	5.3	1.4	1.7	0.8	31	53	1.061	
B7188-55	6	4.5	1.9	1.5	0.8	33	43	1.091	
B7196-1	6	6.2	1.7	2.0	0.8	32	45	1.077	5
-4	4	8.8	3.6	2.8	1.9	31	53	1.079	4
-7	7	6.4	1.7	2.0	0.9	32	50	1.072	
-40	4	5.0	2.4	2.2	1.6	45	66	1.100	6
-49	5	8.8	3.6	3.4	1.9	39	52	1.076	
-53	6	6.5	2.0	1.5	0.8	23	38	1.075	8
-56	7	6.8	2.3	2.3	1.3	34	55	1.079	6
-64	6	2.3	1.1	1.7	0.8	71	77	1.088	5
-65	4	6.8	2.1	2.2	1.1	33	50	1.080	
-74	12	3.2	1.9	1.5	1.0	46	50	1.093	
-86	5	6.4	1.5	1.4	0.5	22	33	1.068	
-90	6	6.2	1.8	2.8	1.3	46	73	1.070	
B7200-6	6	5.2	2.2	2.8	1.7	55	75	1.081	7
AVERAGE	5.9	5.9	1.9	2.0	1.0	36	51	1.080	

^{1/} Chip color based on NPCI scale (1 = excellent)

California Table 4. Yield and Quality Measurements of New Seedlings Grown at Tulalake in 1971

Seedling	No. of Hills	Total		Yield		% No. 1's		Specific Gravity	Chip ^{1/} Color
		No.	Wt. (lbs)	No.	Wt. (lbs)	No.	Wt. (lbs)		
B7147-1	4	12.0	5.3	7.0	4.1	56	76	1.077	5
-17	5	4.0	1.4	2.2	1.0	55	71	1.081	
-28	6	4.3	1.6	1.8	0.8	42	53	1.077	
-31	4	10.8	2.2	2.8	0.9	26	39	1.082	
-36	2	10.5	3.8	4.5	2.5	43	67	1.070	6
-37	4	7.5	1.2	0.2	0.1	3	10	1.075	
-73	4	8.0	1.9	3.0	1.1	60	60	1.087	7
-83	2	4.0	1.8	2.5	1.5	62	86	1.080	
B7159-26	4	10.5	2.6	4.2	1.7	40	63	1.077	
B7160-1	3	4.3	1.4	0.7	0.2	15	12	1.073	
B7187-1	2	9.5	3.0	3.0	1.8	32	58	1.075	
B7188-55	4	5.5	2.0	2.5	1.1	45	56	1.073	
B7196-1	5	6.8	2.5	4.2	2.0	62	82	1.075	
-4	4	10.5	3.2	4.2	2.1	40	63	1.083	
-7	6	5.2	1.9	2.7	1.4	52	72	1.076	
-40	4	9.5	2.9	4.1	1.9	43	67	1.071	7
-49	4	9.5	2.9	4.1	1.9	43	67	1.071	7
-53	6	5.3	2.0	2.7	1.5	50	76	1.085	
-56	4	9.2	3.1	4.0	1.9	43	63	1.073	6
-64	4	6.5	1.8	2.2	0.9	35	50	1.079	6
-65	4	8.2	2.0	2.0	0.8	32	38	1.074	
-74	2	9.5	3.2	5.0	2.2	53	69	1.071	
-86	4	5.8	2.2	3.8	1.9	65	83	1.075	
-90	4	4.2	1.6	2.8	1.2	65	77	1.073	
B7200-6	4	10.0	3.5	5.8	2.6	58	75	1.071	
A477-8	6	8.0	1.6	1.8	0.6	23	36	1.073	
A483-6	6	8.2	3.0	4.5	2.3	55	77	1.087	6
A503-42	6	10.2	4.7	8.5	4.4	84	94	1.086	5
A62180-2	6	8.3	3.0	4.8	2.4	58	80	1.077	
A6305-20	6	8.2	2.4	3.2	1.4	39	58	1.077	
A6334-19	6	6.5	1.8	2.3	0.9	36	52	1.082	8
-20	6	3.8	0.9	1.5	0.5	39	57	1.069	
A6353-6	6	9.2	2.5	2.7	1.3	29	53	1.090	
A6382-10	6	8.7	2.4	3.8	1.5	44	64	1.085	
A63123-7	6	11.0	2.3	3.5	1.2	32	51	1.092	
A63126-9	6	10.8	3.5	4.8	2.4	45	68	1.089	
A63134-45	6	13.7	3.3	2.0	1.0	15	29	1.087	
A6477-4	6	3.0	1.5	3.0	1.5	100	100	1.076	
A64139-22	6	10.0	2.8	4.0	1.8	40	65	1.080	
A64140-3	6	12.5	3.7	5.7	2.4	45	66	1.072	
A64187-4	6	6.7	3.0	4.3	2.5	65	85	1.084	8
A64206-4	6	9.3	3.1	3.5	1.9	38	62	1.087	
-5	6	6.8	2.7	5.0	2.2	73	84	1.086	
A6536-5	6	10.8	2.2	3.3	1.0	31	46	1.082	
A6673-15	6	6.8	2.7	4.2	2.2	61	81	1.081	
A6698-2	6	6.7	2.7	4.2	2.2	62	83	1.081	
A66107-44	6	8.2	2.2	2.7	1.2	33	54	1.077	
-69	8	4.1	0.7	0.6	0.2	15	27	1.068	

California Table 4. (Continued)

Seedling	No. of Hills	Total		Yield No. 1's		% No. 1's		Specific Gravity	Chip ^{1/} Color
		No.	Wt. (lbs)	No.	Wt. (lbs)	No.	Wt. (lbs)		
A66107-75	6	11.7	3.7	1.3	0.5	11	14	1.075	
-98	8	6.9	3.0	3.5	2.2	51	73	1.078	9
-101	6	5.2	1.3	1.3	0.5	26	39	1.069	
-117	6	6.0	2.9	3.5	2.5	58	86	1.077	
-180	6	9.2	3.2	3.8	2.2	42	69	1.075	8
A66119-6	6	5.0	1.5	1.3	0.8	27	53	1.080	
A66122-3	6	8.5	3.7	4.2	2.8	49	74	1.078	6
NDA7938-3	6	2.5	0.8	2.0	0.7	80	94	1.074	
AVERAGES									
B Lines	4	7.6	2.4	3.3	1.6	45	61	1.076	
A Lines	6	8.0	2.5	4.2	2.2	47	64	1.080	
All Lines	5	7.8	2.5	3.8	1.9	46	63	1.078	

^{1/} Chip color based on NPCI scale (1 = excellent)

California Table 5. Top ten seedlings in each of several quantity and quality factors.

<u>No. 1 Tubers per Hill</u>		<u>Percent</u>	<u>Specific</u>	<u>Appearance</u>
<u>Number</u>	<u>Weight</u>	<u>No. 1's (Wt.)</u>	<u>Gravity</u>	<u>Acceptability</u>
<u>A. Shafter</u>				
B7147-36	B7196-49	B7196-64	B7196-40	B7196-40
B7196-49	-4	B7200-6	-74	-56
-4	B7147-36	B7196-90	B7147-28	B7147-1
-90	B7200-6	B7147-28	B7188-55	-17
B7200-6	B7196-40	B7160-1	B7159-26	-36
B7147-31	B7147-31	B7196-40	B7196-64	-37
-28	B7196-56	B7147-36	B7147-1	B7196-4
-73	-90	-31	-36	-64
B7196-56	B7147-73	B7196-56	-31	B7200-6
	B7196-56		B7200-6	B7196-1
<u>B. Tulalake</u>				
A503-42	A503-42	A6477-4	A63123-7	B7159-26
B7147-1	B7147-1	A503-42	A6353-6	B7196-86
B7200-6	A66122-3	NDA7938-3	A63126-9	B7147-1
A64140-3	B7200-6	B7147-83	B7147-73	-17
B7196-74	B7147-36	B7147-117	A483-6	B7188-55
A64206-5	A64187-4	A64187-4	A63134-45	B7196-40
A63126-9	A66107-117	A64206-5	A64206-4	A477-8
A62180-2	A62180-2	A6698-2	A503-42	A6334-19
A483-6	A64140-3	B7196-1	A64206-5	NDA7938-3
B7147-36	A63126-9	A6673-15	A6382-10	A483-6
				A66122-3

COLORADO

James A. Twomey

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SEEDLING PROGRAM. Approximately 20,000 first year seedlings were grown in 1971. These were supplied by Dr. Raymon E. Webb, Beltsville, Maryland and Dr. Donald W. Denna, Colorado State University, Fort Collins, Colorado.

Seedlings were planted the first week in May and were harvested the second week in September. Despite severe hail damage the last week in July, most seedlings made a remarkable recovery. Over 400 first year seedlings were selected for testing in 1972. From 469 seedlings selected in 1970, 64 were retained for further testing.

Chip and french fry color tests were made on 74 varieties and advanced seedlings. These data may be found in Tables 1 and 2. Preliminary chip and french fry color tests were also conducted on 64 second-year seedlings and may be found in Tables 3 and 4.

Colorado Table 1. Chip color^{1/} and specific gravity^{2/} of 1971 advanced seedlings.

Clone	Specific Gravity	Harvest Color	3Wk's 70° Color	10Wk's 40°		10Wk's 50°	
				1Wk 70° Color	3Wk's 70° Color	1Wk 70° Color	3Wk's 70° Color
BC7204-12	1.072	27.0	24.0	7.5	11.0	16.0	20.0
BC7204-4	1.060	25.0	27.0	8.0	10.0	11.0	14.0
BC7204-1	1.070	28.0	23.0	7.0	12.0	17.0	29.5
BC7204-5	1.075	28.0	25.0	7.0	9.0	12.0	17.0
BC7204-3	1.068	29.0	28.5	8.0	12.5	13.0	19.0
BC7204-14	1.070	39.0	39.0	8.0	20.0	13.0	25.0
BRC7371-3	1.072	36.0	23.0	6.0	10.0	19.5	20.0
BC7204-20	1.067	32.0	21.0	5.0	10.0	11.0	18.0
BC7163-2	1.079	38.0	36.5	30.0	30.0	18.0	29.0
BC7257-2	1.104	42.0	37.0	30.0	32.0	35.0	35.0
BC7257-1	1.094	41.0	41.5	23.0	34.0	31.0	32.0
BC7222-13	1.084	31.0	30.0	8.0	10.0	13.0	20.5
BC7222-5	1.086	51.0	50.0	14.0	23.5	32.0	37.5
BC7222-30	1.082	44.0	42.0	8.5	14.0	26.0	28.0
BRC7354-3	1.070	28.0	22.0	6.0	6.0	14.0	16.5
BRC7401-1	1.077	30.0	23.0	7.0	11.0	15.0	15.0
WC325-1	1.100	42.0	33.0	11.0	24.5	27.5	33.0
BRC7358-1	1.071	40.0	37.5	9.5	16.0	20.5	21.0
70-219-1	1.086	38.0	35.0	10.0	27.5	27.0	29.0
70-38-3	1.087	33.5	33.5	15.5	22.0	27.0	36.5
70-801-24	1.086	37.0	32.0	19.5	27.0	17.5	34.0
70-535-2	1.076	38.0	38.0	14.5	25.0	18.0	29.0
70-801-1Y	1.070	27.0	25.5	8.0	13.0	10.5	17.0
70-159-1	1.073	30.0	28.0	12.0	25.0	20.0	30.0
70-600-1	1.080	38.0	36.0	17.0	22.0	15.0	29.0
70-587-2	1.080	34.0	32.0	9.5	21.0	17.5	19.0
70-323-1	1.073	29.0	25.0	12.0	10.0	12.0	16.0
70-535-1	1.078	36.0	29.0	8.0	15.0	18.0	26.0
70-445-1	1.080	35.0	33.0	14.0	23.0	24.0	26.5
70-735-2	1.081	25.0	21.5	9.0	11.0	11.5	14.0
70-637-3Y	1.076	35.0	35.0	14.5	19.0	22.5	21.0
70-231-1	1.086	38.0	34.0	10.0	20.0	23.0	30.0
BT5215-2	1.085	46.0	42.0	19.5	31.0	29.5	40.0
BC7021-1	1.084	39.0	38.0	30.0	26.0	35.0	35.0
BC7028-3	1.074	38.0	29.0	11.0	22.0	23.0	33.5
BC7010-2	1.084	30.0	29.0	8.5	13.0	20.5	26.0
UX123-4-2	1.085	42.0	37.5	10.0	19.0	22.5	27.5
67-64-6	1.085	35.0	31.5	22.0	32.0	20.0	36.0
UX1-41-5	1.079	22.0	21.0	13.0	14.0	16.5	24.5
65-15-7	1.092	39.0	37.0	19.0	31.0	25.5	35.0
66-129-6	1.090	36.0	36.0	16.5	26.0	19.0	31.0
Pennchip	1.077	36.5	42.0	26.0	27.5	36.0	33.5
Pioneer	1.088	32.0	30.0	15.0	25.0	25.0	33.0
DT6063-1R	1.087	38.0	40.0	16.0	25.0	22.5	31.0
B5141-6	1.098	39.0	39.0	30.0	39.0	36.5	40.0
Jewel	1.098	45.0	43.0	24.5	33.0	36.0	42.0
Norchip	1.083	42.0	40.0	20.5	33.5	32.0	29.0
Kennebec	1.088	40.0	39.0	22.5	40.0	32.0	31.0

^{1/} Chip color determined with Photovolt reflectance meter. Color readings of 25 or above acceptable.

^{2/} Specific gravity determined by potato hydrometer.

Colorado Table 2. Specific gravity^{1/} and french fry color^{2/} of 1971 advanced seedlings.

Clone	Specific Gravity	Harvest Color	3Wk's 70° Color	10Wk's 40°		10Wk's 50°	
				1Wk 70° Color	3Wk's 70° Color	1Wk 70° Color	3Wk's 70° Color
WC315-1	1.083	2	1	4	3	3	2
WC300-4	1.086	2	2	4	3	2	2
WC314-2	1.086	1	1	3	3	3	2
WC314-3	1.082	1	2	4	4	4	3
WC330-7	1.088	1	1	3	2	3	1
WC330-4	1.097	1	1	2	1	1	1
WC304-4	1.083	1	1	4	3	3	1
WC325-5	1.092	2	2	3	2	2	1
WC302-7	1.079	1	1	4	3	3	2
WC316-1	1.077	1	1	3	2	2	2
WC316-3	1.083	1	1	2	1	1	1
WC285-110	1.086	2	1	4	4	2	1
BRC-7098-3	1.085	1	1	2	1	1	1
WC285-141	1.086	2	1	3	2	1	1
WC285-146	1.085	1	1	5	3	3	2
WC283-8	1.079	2	1	4	2	2	1
WC284-7	1.093	1	2	4	2	1	1
WC284-20	1.084	2	1	3	3	2	1
WC285-9	1.079	2	1	4	3	2	1
WC285-18	1.081	2	1	3	3	2	2
WC285-83	1.091	1	1	3	2	1	1
WC285-85	1.085	2	1	2	2	1	1
A6334-20	1.079	2	2	3	1	3	1
W168-3	1.098	2	1	3	1	2	1
WC230-14	1.082	1	2	4	4	2	2

1/ Specific gravity determined by potato hydrometer.

2/ U.S.D.A. color standards for frozen french fried potatoes, scale 1-5, 1 light 5 dark.

Colorado Table 3. Preliminary chip color test^{1/} on 1971 second year seedlings

Clone	10Wk's 50° 1Wk 70° Color	Clone	10Wk's 50° 1Wk 70° Color
BC7585-2	23.0	BC7667-5	22.0
BC7585-5	36.0	BC7670-1	20.0
BC7601-3	22.0	BC7671-1	8.0
BC7602-1	40.0	BC7671-3	9.5
BC7605-1	25.5	BC7681-5	26.0
BC7605-2	29.0	BC7761-1	14.0
BC7606-1	31.0	BC7769-1	16.5
BC7606-4	35.0	BC7769-3	27.0
BC7632-1	31.0	BC7772-2	10.0
BC7632-2	15.0	BC7773-1	20.0
BC7632-6	29.0	BC7805-1	25.5
BC7635-2	30.0	BC7805-2	26.0
BC7635-4	16.0	BC7805-5	23.0
BC7640-3	24.5	BC7805-9	32.0
BC7640-5	19.0	BC7805-10	23.0
BC7640-8	25.0	WC344-11	19.0
BC7641-4	11.0	WC345-6	27.0
BC7643-2	11.0	WC345-14	31.5
BC7665-3	34.0	WC348-2	23.0
		WC362-10	16.0

^{1/} Chip color determined with Photovolt reflectance meter. Color readings of 25 or above acceptable.

Colorado Table 4. Preliminary french fry color tests^{1/} on 1971 second-year seedlings.

Clone	10Wk's 50°	Clone	10Wk's 50°
	1Wk 70° Color		1Wk 70° Color
BC6736-2	2	WC316-1	2
BC7667-4	3	WC316-4	3
BC7668-1	2	WC316-5	3
BC7679-4	3	WC316-7	2
BC7682-2	2	WC316-10	4
BC7682-3	3	WC326-4	2
BC7683-3	4	WC327-7	3
BC7684-1	4	WC331-1	2
BC7685-1	3	WC331-2	3
BC7685-3	2	WC331-3	2
BC7794-4	2	WC344-13	1
BC7812-1	3	WC344-16	2
		WC345-15	1

^{1/} U.S.D.A. color standards for frozen french fried potatoes, scale 1-5, 1 light
5 dark.

CONNECTICUT

Arthur Hawkins

A potato variety test was conducted in 1971 on a commercial farm in the Connecticut River Valley. The location had been in tobacco for several years prior to 1971. Good conditions of soil, early planting, irrigation as necessary, ample moisture in late August and early September, and good insect control favored good yields. Vines of longer-season varieties were green until late September.

Seed was supplied by the USDA National Potato Breeding Program from Presque Isle, Maine, except NY-41 from Cornell; Norchip and Wauseon from the Maine Department of Agriculture, grown at Sangerville, Maine.

Plots were single rows, 21 feet, replicated four times. Experimental procedures, total yields, yields over 1-7/8", yields over 1-7/8" with seriously off-shaped tubers removed, specific gravity, and chip color are given in Connecticut Table 1. Soil tests and fertilizer rates are also given in the footnotes.

Yields. Highest yields over 1-7/8" and free of off-shape were produced by NY-41, B6567-12, and Abnaki; followed by B6516-27, Cascade, Peconic, Oramonte, and Katahdin.

Specific Gravity. Highest specific gravity was produced by B6562-14, NY-41, Norchip, Oramonte, Cascade, B6516-27, B6567-12, followed by Abnaki, Peconic, and Katahdin.

Chipping Quality. Peconic was superior in chipping quality to all other varieties, followed by Norchip, Oramonte, and B6562-14. Following harvesting on 10/18/71, potatoes had been stored at 50° F or above until graded in late November, then at 55° F until reconditioned at 70° F for two weeks prior to chipping on 2/9/72.

Tuber Observations. Presence of hollow-heart, drought spot, stem-end discoloration and vascular discoloration was determined on 20 tubers (10 tubers from each of two replicates), size 2½-3" diameter.

Hollow-heart: Katahdin, one in 20 (1/20); Norchip, 4/20; Wauseon, 3/20; NY-41, 4/20; others, none.

Drought spot: Norchip, three in 20 (3/20); Oramonte, 7/20; Peconic, 1/20; NY-41, 1/20; B6516-27, 5/20.

Stem-end discoloration: Slight (1/8"-1/4"): Katahdin and Oramonte, 9/20; Alamo, 7/20; Abnaki, Peconic, 6/20; Norchip, Superior, Wauseon, 5/20; NY-41, 4/20; Cascade, 2/20; B6567-12, 10/20; B6516-27, 4/20; B6562-14, 3/20. Moderate (1/4"-1/2"): Superior, 4/20; Oramonte, Wauseon, 3/20; Alamo, 2/20; Abnaki, 1/20; B6562-14, 5/20; B6516-27, B6567-12, 1/20.

Vascular discoloration: Very slight: Oramonte, 5/20; Abnaki, Katahdin, 4/20; Alamo, 3/20; Norchip, Peconic, Superior, B6516-27, 2/20; B6567-12, 1/20. Slight: Oramonte, 6/20; Alamo, Wauseon, B6567-12, 4/20; Cascade, Norchip, Superior, 2/20; Katahdin, 1/20. Moderate: Superior, 1/20/

Connecticut Table 1. Yield^{1/}, specific gravity, and chip^{2/} color of potato varieties and seedlings - Connecticut, 1971^{2/}

Variety or seedling ^{3/} (Spacing 9" except *)	Total yield per acre	<u>Yield per acre over 1-7/8"</u>				Tubers over 4"	Specific gravity ^{5/}	Chip color 2/9/72
		Free of offshape ^{4/}						
	Cwt	%	Cwt	%	Cwt	%	1.0+	
Abnaki	559	96	534	95	533	2.3	66	8.5
Alamo	426	90	383	88	375	0.0	57	9.7
Cascade	591	91	539	85	504	0.3	69	9.6
Katahdin	493	96	474	96	474	3.0	64	8.2
Norchip(10")*	539	92	494	85	459	0.4	71	7.4
Oramonte	559	89	499	86	481	0.0	71	7.5
Peconic(10")*	536	95	507	95	501	4.4	66	6.3
Superior	428	97	414	96	412	3.2	60	8.3
Wauseon	418	96	400	95	398	0.9	60	8.8
NY-41(8")*	612	96	590	95	585	5.5	71	9.0
B6516-27	536	96	512	95	510	0.0	69	8.5
B6562-14	432	88	382	87	375	0.0	74	7.5
B6567-12	566	97	546	95	539	1.0	69	9.4

1/ Plots: 1 row 21 feet; rows 35" apart. Replication: four in randomized blocks (each 4 sections x 4 rows) not damaged by sprayer wheels. Soil: Narragansett silt loam; shade tobacco previous several years; pH 5.5; P = H; K = H; Mg = M. Fertilizer: 2150 lbs 8-10-10-3 per acre side-bands at planting.

2/ Season and conditions: So. Windsor, 12 miles N.E. of Hartford. Planted: 5/5/71. Irrigated late June and July; ample rain late August and September. Percent green 9/10/71: Oramonte, 90%; B6516-27, 80%; NY-41, 70%; others 40-60%, except Abnacki 35%, B6562-14, 30%, and Alamo, 0%. Percent green 9/23/71: Oramonte, 70%; NY-41, 50%; Norchip and B6516-27, 40%; Cascade, 30%; Katahdin, 20%; Abnaki and Peconic, 15%; others 5% or less.

3/ Seed cut 1½-2 oz.; spaced 9" apart except as indicated.

4/ Considerable growth cracks in Norchip.

5/ Specific gravity: Average of 4 replicates; tubers 2½-3"; 8 lb samples, weight in air and water method.

6/ Harvested: 10/14/71. Storage: Farm storage 50° F or above until 11/19/71, then stored at 55° F. Specific gravity run 12/22/71. Storage temperature raised to 70° F on 1/18/72. Chipped on 2/9/72. Chip color: Average of 20 chips, 10 from each of two replicates. Chips 6.0 and 7.0 light; 8.0 acceptable; higher reading, darker chip. Sprouts 2/9/72: Superior, 1-1¼"; Cascade, Norchip, Oramonte, Wauseon, 3/4-1"; Alamo, B6516-27, 1/2-3/4"; Katahdin, B6562-14, ¼-½"; NY-41, Peconic, ¼".

DELAWARE

Eugene P. Brasher

Sixteen breeding lines and four named varieties were tested in 1971. The experimental conditions and procedures were as follows: Soil, Norfolk sandy loam; planting date, 4/12/71; plot design, randomized block; replications, five; plot size, 3 by 15 feet; spacing in row, eight inches; fertilizer, 1500 lbs/A of 10-10-10 in bands at planting time; irrigation, as needed to maintain soil moisture above 50% available; fungicide, Maneb; insecticide, Sevin; harvest date, 9/7/71. The results are shown in the following table.

Delaware Table 1. Yield and Specific Gravity Tests, Delaware Agricultural Substation, Georgetown, Delaware, 1971

Breeding Line or Variety	Yield per Acre Over 1-7/8"		Specific Gravity ^{1/}
	Cwt.	Pct.	
B6532-4	383	96	526
Kennebec	352	91	617
B6495-20	333	91	549
Superior	316	92	560
B5665-7	315	86	526
B6603-6	309	92	560
B6603-12	307	84	549
Katahdin	303	89	449
B6138-3	292	86	549
B6564-9	289	90	583
B6503-5	289	89	549
B6516-26	287	95	593
B5698-8	281	86	449
B5647-8	251	86	515
B6562-14	231	82	672
B6516-10	230	92	638
B6564-27	224	91	583
Haig	215	77	449
B6595-12	175	77	672
B6532-14	102	65	593
L.S.D. - 5% Level	37	-	045

^{1/} 1.0 omitted

DELAWARE

Robert F. Stevens, Francis Webb and Roger Ginder^{1/}

Potato Variety and Seedling Performance at Dover, Delaware, 1971

Five varieties of white potatoes were compared as to yield, quality, chip color, scab resistance, air pollution susceptibility and maturity. Observations were made on 25 U.S.D.A. seedlings and varieties plus N.Y.-41. All plots were planted April 14 and 15, 1971. All plots except as otherwise noted received 1,100 pounds of 14-17-17 at planting. Rows were 36 inches apart and seed was dropped at seven and 12 inch spacing. The entire area was treated with Thimet. A regular spray schedule was followed. Rainfall was deficient in June and early July and all plots were irrigated twice. However, all plots were below optimum soil moisture level at least twice during the active growing period in late June and July.

Delaware Table 1. Performance of Four Varieties and One Seedling

Variety	Yield cwt/A		Maturity ^{1/}	Specific Gravity	Chip Quality ^{2/}	Ozone Rating ^{3/}	Scab Rating ^{4/}
	July 21	Aug. 13					
Superior	227.9	326.7	1	1.076	B-	1	1.0
Haig	225	245.4	2	1.074	B	1	1.0
Cascade	162.6	303.5	4	1.071	C-D	0	2.0
6-HS-9	167	274.4	4	1.071	A	1	3.5
La Chipper	162.6	257	3	1.073	A-	2	2.5

^{1/} Based on: 1-4 rating, 1-Earliest, 4-Latest

^{2/} Chip quality: A-Excellent, B-Good, C-Acceptable, D-Not Acceptable

^{3/} Based on: 1-10 rating, 0-None, 10-Severe

^{4/} Based on: 1-5 rating, 1-None, 2-Very light, 3-light infection, 4-Moderate

Note: No replications - 4 harvests: August 21, August 29, September 5, and September 13. Only first and last yields included in above Table. Scab determinations made by Robert Carroll, Extension Plant Pathologist.

^{1/} Extension Horticulturists, Kent County Agent, Extension Marketing Specialist, respectively.

Delaware Table 2. Performance of 25 Seedlings

<u>Variety</u>	<u>Cwt/A U. S. No. 1</u>	<u>Specific Gravity</u>	<u>Air Pollution Rating^{1/}</u>	<u>Chip Rating^{2/}</u>	<u>Scab Rating^{3/}</u>
B-6879-5	251.9	1.064	3	C	1.5
B-6741-2	241.0	1.060	3	D	
B-6495-20	280.9	1.063	1	B	2.0
B-6516-20	217.0	1.064	0	B	2.5
BR-6316-5	300.5	1.0637	3	C	2.5
B-6516-26	348.4	1.065	8	B	3.0
B-6741-16	211.2	1.054	5	E	3.0
B-6603-12	244.6	1.066	6	C	3.0
B-6741-22	168.4	1.057	6	D	1.5
B-6545-7	355.7	1.055	4	E	2.0
BR-6316-7	221.4	1.0635	8	B	2.5
B-6751-3	227.2	1.057	4	C	1.5
B-6879-11	197.4	1.054	3	D	1.5
B-6741-11	333.9	1.059	5	B	2.5
B-6741-3	243.9	1.067	9	A	1.5
B-6562-14	347.7	1.063	4	D	2.5
B-6535-10	326.7	1.056	2	D	3.5
B-6797-2	71.8		7		1.5
B-5698-8	299.1	1.055	7	A	1.5
B-6750-3	286.7	1.055	5	C	3.5
B-6887-6	529.9	1.057	3	E	1.5
B-6743-3	375.3	1.060	1	A	3.0
B-6751-13	399.3	1.060	2	D	2.5
B-6532-4	342.6	1.060	2	D	2.5
N.Y.-41	435.4	1.063	2	D	1.50
Superior	397.2	1.065	1	B	1.0

^{1/} Air Pollution (ozone) injury rating based on: 1-10 rating, 0=None, 10=Severe

^{2/} Chip Quality: A=Excellent, B=Good, C=Acceptable, D=Not Acceptable, E=Poor

^{3/} Scab rating 1-5, 1=None, 2=Very Light, 3=Light infection, 4=Moderate

ICELAND (Reykjavik and Eyrarbakki)

Einar I. Siggeirsson, Stangarholt 30

Nineteen seedlings and six varieties were grown in nematode-infested, sandy soil at Eyrarbakki, South Iceland, for comparison with the commonly grown variety Gullanga.

Twenty seedlings, six varieties, and several wild Solanum spp., resistant to Heterodera rostochiensis Wall., were grown in clear muck soil in Reykjavik.

The growing season temperatures (June-September) were above normal. May and June were dry, but the period July through September had an adequate supply of moisture. The harvest was completed October 6. The yields were all above average. The seedlings and varieties were planted in 6-row plots (3x12 feet) with an 18-inch seed spacing.

The following fertilizer was applied per acre. ammonium nitrate, 112 pounds; superphosphate, 80 pounds; K_2O , 82 pounds; and sulfur, 10 pounds. The sulfur was used to decrease common scab.

H. rostochiensis has been found in 25 locations in Iceland, but pathotype investigations have not been carried out for three locations only, Eyrarbakki, Grafarbakki, and Keflavik. These pathotypes have not been compared with those found in European countries and the U.S.A. They have been given the arbitrary names: Eyrarbakki pathotype (I), Grafarbakki pathotype (II), and Keflavik pathotype (III).

Yields are given in Iceland Table 1. The seedlings differ in their resistance to the golden nematode. Line EIS-75-Hr is resistant to pathotype I; EIS-172-Hn is resistant to pathotype II, and EIS-3251-Ky is resistant to pathotype III. They are early maturing and have as good flavor and cooking qualities as potatoes currently used in Iceland. The Wauseon and Alamo yielded well both in clean and infested soil. They have good flavor and cooking qualities and will be increased in the future. Line B4557-2 matured late but showed foliage resistance to frost under Icelandic conditions. This clone is now being used in frost-resistant crosses.

Iceland Table 1. Potato varieties and seedlings tested in Iceland 1971 for golden nematode resistance.

Variety or Seedling	Yield Per Acre		Resistance to golden nematode		
	Nematode (Infested) Soil (Sandy loam) Total	Clear Soil Muck Total	Type		
			I	II	III
	cwt.	cwt.			
EIS-75-Hn	92	107	Excellent	Poor	Good
EIS-172-Hn	90	105	Poor	Excellent	Poor
EIS-3251-K ₄	90	104	Poor	Poor	Excellent
N.D. 4122-2	90	100	Good	Good	Medium
B-4557-2	91	101	Excellent	Excellent	Excellent
B-4537-8	92	102	Poor	Medium	Good
B-4296-9	81	74	Good	Medium	Poor
B-4494-15	82	75	Good	Medium	Poor
B-1558-1	83	78	Poor	Medium	Medium
B-4824-1	58	71	Good	Good	Medium
B-4824-7	63	68	Good	Good	Medium
B-4839-2	70	78	Poor	Poor	Poor
B-4159-2	40	45	Poor	Poor	Poor
B-4151-2	30	35	Poor	Poor	Poor
B-5281-1	75	86	Good	Medium	Medium
B-5288-5	67	75	Excellent	Medium	Medium
B-5132-3	71	76	Good	Good	Good
EIS-173-Hn ₃	83	85	Excellent	Poor	Poor
Antinema	58	69	Poor	Poor	Poor
B-5141-6	85	88	Medium	Medium	Medium
Wauseon	89	93	Medium	Medium	Excellent
Alamo	90	92	Medium	Excellent	Medium
Nooderling	70	79	Medium	Good	Medium
Gullanga	25	73	Poor	Poor	Poor

PACIFIC NORTHWEST

J. J. Pavcek and D. R. Douglas

Breeding

First year selections were grown in 1412 5-hill plots at the Tetonia Station; 382 were harvested according to selection of these clones at Aberdeen. Three hundred thirty-nine advanced, intermediate, and new clones were grown as tuber-units for seed increase.

Spaced single-hill seedlings were grown at the Aberdeen Station during 1971 instead of at the Tetonia Station, because of a more favorable environment for selection. Approximately 28,500 single hills were grown, 850 of these were selected for further testing. 1412 selections were grown in 5-hill plots; 382 of these were selected for further testing.

Yield Trials. Five yield trials were conducted in 1971. These were the advanced, early harvest, intermediate, preliminary, and preliminary early harvest yield trials. These trials were planted between the 5th and 20th of May. A ten-inch spacing was used within rows and 36 inches between rows. The soil was a Declo silt loam. Two hundred pounds of nitrogen had been broadcast the previous fall and an additional 50 lbs N and 100 lbs of phosphate were banded at planting. Temik (3 lb actual) was also banded at planting for aphid control. Approximately 16 inches of water were applied in furrows throughout the season as needed.

The weather during May, June, and July was cooler than usual, averaging 1-1/2 degrees below normal in May and June and 3 degrees lower in July. August was hot, averaging 1.7 degrees above normal. September was 6.6 degrees below normal and the first killing frost occurred on September 18.

The early harvest trials were sprayed with dinitro vine killer on August 13 and harvested on August 27. The remaining yield trials were harvested during the first week of October. The results of the Advanced Yield Trial and the Early Harvest Trial are presented in P.N.W. Tables 1 and 2, respectively.

In the Advanced Yield Trial, the total yields and the yield of U.S. No. 1's were good. The specific gravities, however, were moderately lower than the average for this location. Top yielding A503-42 had an outstanding specific gravity of 1.088. Most of the clones made acceptable french fries after being stored for two months at 45°.

Seed of the more uniform and attractive of these clones, i.e., A503-42, A6334-19, A6371-2, and A63126-2 were given to processors for increase during the growing season and for their subsequent processing evaluations.

Satisfactory yields were obtained from most of the clones in the Early Harvest Trial; however, the specific gravity of many was lower than desired. After four months storage at 45° most clones produced french fries of satisfactory color; however, the texture of only a few would be acceptable. Overall, A6698-4 and A66107-101 are the outstanding clones in this trial.

Distribution. The distribution of clones, seedling tubers, and seeds during 1971 are shown in Table 3. Selections and varieties were distributed to 25 cooperators located in 11 states or provinces. Seedling tubers were distributed to three cooperators at three locations and hybrid seeds were distributed to two cooperators at two locations.

P.N.W. Table 1. Advanced Yield Trial, Aberdeen, Idaho, 1971. (Four replications of 20 hills)

Clone	Tuber Yield										French 3/ Fries	Tubers 4/ Russet-		
	US No. 1					US No. 2						Tex.	Color	Shape
	Total	Cwt/A	Over 10 oz	%	Under 4 oz	%	Mal- formed	%	Specific 1/ Gravity	Steamed 2/ Tex.				
A503-42	524	92	42	1	6	1	88	2.8	2.7	2.5	1	1		
A64140-3	495	85	50	6	7	2	80	3.3	4.6	3.0	7	4		
NDA7938-3	484	79	41	7	7	8	78	4.3	3.0	2.0	5	4		
A66107-180	481	88	37	2	9	1	76	3.0	4.0	3.8	1	4		
A64206-5	472	82	28	8	5	5	82	4.7	3.0	3.0	7	5		
A64206-4	467	64	19	11	10	15	87	4.3	4.4	3.0	5	5		
A66107-44	457	85	34	5	10	1	84	3.1	4.8	3.3	4	5		
A6477-4	457	73	21	9	15	4	77	4.0	4.2	3.0	7	4		
A6371-2	453	83	27	6	10	2	82	3.5	4.1	3.0	4	4		
A66122-3	430	80	34	5	11	3	76	2.7	3.0	2.5	6	5		
A483-6	423	77	32	7	9	7	77	5.0	3.0	2.8	6	5		
A66107-75	420	83	39	6	9	2	78	2.5	4.0	4.0	6	5		
A64139-22	415	91	37	1	8	1	82	4.1	5.0	2.8	7	2		
A63126-9	401	82	33	4	12	3	87	2.9	2.6	3.0	5	6		
A6334-19	394	88	29	1	10	2	82	2.8	4.0	2.8	8	5		
A6673-15	381	65	36	15	8	12	76	3.3	3.0	3.0	6	4		
A6371-3	381	84	51	4	8	5	81	2.5	4.2	2.0	6	4		
A66107-116	381	71	26	6	18	4	84	5.0	3.2	2.8	6	6		
Russet Burbank	379	77	23	8	12	3	81	3.6	3.7	2.4	5	6		
A62180-2	377	92	53	1	5	2	82	2.0	3.0	1.3	7	2		
A6305-20	375	88	35	3	6	3	70	2.7	4.8	3.8	7	4		
A66107-101	372	83	49	9	6	2	83	2.7	5.0	3.0	6	4		
A6698-2	371	69	27	9	11	12	83	3.1	3.0	2.5	5	5		
A63126-2	368	80	16	1	19	1	82	2.5	3.0	3.5	5	6		
A66107-98	361	79	23	2	17	2	86	3.7	3.8	3.0	5	4		

P.N.W. Table 1. Continued.

Clone	Tuber Yield										French ^{3/} Fries	Steamed ^{2/} Tex. Color	Specific ^{1/} Gravity	Mal- formed %	Under 4 oz %	US No. 2 %	US No. 1		Tubers ^{4/} Russet- ing	Shape
	Total	Cwt/A	Total	Over	10 oz %	Total	10 oz %	Total	10 oz %											
A6536-5	353		80	23	6	13	2	88	4.5	3.0	2.3	4	5							
A6334-20	344		85	32	3	12	1	82	3.0	4.0	3.0	8	5							
A477-8	342		65	21	5	14	16	77	5.0	4.0	2.5	5	6							
A6353-6	337		72	20	6	20	2	93	5.0	3.2	2.5	5	4							
A6382-10	326		78	42	7	8	8	87	5.0	3.8	2.8	6	5							
A66119-7	292		74	15	10	14	3	84	5.0	3.2	3.3	6	6							
A63123-7	287		74	11	2	23	1	96	4.2	4.0	2.3	2	4							
A63134-45	285		71	5	3	23	3	87	5.0	2.0	2.8	8	4							
A66107-69	264		86	44	4	9	2	77	3.7	5.0	2.5	5	4							
A64187-4	169		77	37	10	10	3	75	3.7	4.0	3.0	3	4							
Mean	386		79	31	5	11	4	82			2.8									
LSD 5%	77							05												

^{1/} 1.0 omitted.

^{2/} 1.0 (lowest) to 5.0 (highest), $\frac{1}{2}$ inch longitudinal slices (one per each of 3 tubers) steamed (205° F) for 45 minutes. These scores for 1970 crop.

^{3/} 1.0 (lightest) to 5.0 (darkest), stored 2 months at 45° F.

^{4/} Russetting: 1.0 (none) to 8.0 (heavy); Shape: 1.0 (round) to 6.0 (long).

P.N.W. Table 2. Early Harvest Yield Trial, Aberdeen, Idaho, 1971. (Four replications of 20 hills)^{1/}

Clone	Tuber Yield										Tubers		
	US No. 1					US No. 2					French Fries	Russet-ing	Shape
	Over		Under 4 oz	Mal-formed %	Specific Gravity	Steamed							
	Total	%				Tex.	Color						
	Gwt/A	%	%	%	%	%	%	%	%	%	%	%	%
A6356-6	371	86	32	4	8	2	72	2.2	2.9	3.0	2	5	
NDA7697-2	363	84	46	8	5	3	71	3.0	3.0	2.5	3	3	
A6673-1	357	74	22	8	8	11	70	1.9	2.7	3.0	4	3	
A6673-4	322	78	15	6	12	4	67	2.2	3.2	2.5	6	3	
A66110-2	313	74	38	9	5	11	75	2.7	3.5	3.3	6	3	
A6698-4	301	82	29	8	7	4	77	3.0	3.5	2.5	5	4	
NDA7746-4	301	83	19	1	13	2	80	2.9	2.7	2.0	6	5	
A66110-7	300	90	28	4	6	1	79	2.7	3.0	3.2	5	4	
A66107-17	287	77	9	2	20	1	80	2.7	3.0	3.0	5	4	
A66123-2	287	71	24	8	7	13	70	1.9	2.5	2.7	6	4	
A6695-3	284	74	17	15	9	2	78	2.0	3.0	3.0	4	4*	
A6695-5	281	93	63	1	5	1	86	2.7	2.9	3.2	4	3	
NDA7698-1	277	63	14	19	13	4	72	2.0	3.0	3.0	3	4	
A6680-5	277	78	9	6	14	3	76	2.0	2.9	1.0	5	5	
A66107-101	274	81	18	4	14	2	80	3.0	3.3	1.5	5	5	
A66107-197	272	91	28	2	8	1	80	2.5	3.3	2.3	2	3	
A66107-182	268	64	1	2	32	1	77	2.5	3.3	2.5	6	4	
NDA8099-11	260	64	16	10	16	10	71	2.9	3.0	2.8	3	4	
A63171-1	248	68	8	12	18	2	72	2.5	3.0	2.8	5	5	
NDA7746-1	237	89	14	3	6	2	82	2.9	2.7	1.8	7	3	
Russet Burbank	233	68	12	9	14	10	75	2.7	3.0	1.8	5	6	
A5943-1	230	79	23	2	11	8	80	3.4	3.2	2.0	6	4	
NDA7932-1	225	78	31	11	8	3	78	2.9	3.2	2.3	4	5	
A66107-172	186	69	13	2	29	0	80	2.5	3.2	2.8	3	4	
NDA7919-2	185	67	4	2	27	4	73	3.0	3.0	1.3	6	3	
A66110-25	173	72	23	8	12	7	86	3.0	3.0	2.3	5	4	
NDA8304-4	157	70	6	4	24	3	75	2.9	3.0	3.0	6	5	
Mean	268	77	21	6	13	4	76						
LSD 5%	58						03						

^{1/} See P.N.W. Table 1 footnotes.

* Pear shaped.

P.N.W. Table 3. Distribution of Selections, Varieties, Seedlings, or Seeds, 1971.

Location	Cooperator	Number
<u>Selections/varieties</u>		
Arizona	P. Bessey	366
California	H. Timm	3
	R. Voss	46
Colorado	D. Denna	12
Idaho	E. Anderson	10
	W. Dazey	1
	J. Garner	6
	M. Groskopp	24
	H. McKay	5
	R. Ohms	2
	E. Owens	5
	C. Painter	2
	G. Vogt	4
	A. Walz	4
Maine	R. Akeley	2
	R. Nickeson	13
	R. Webb	28
Maryland	L. Sanford	11
New Brunswick	D. Young	4
Ontario	G. Johnston	1
Oregon	G. Carter	17
	L. Fitch	14
	J. B. Holladay	31
Utah	G. Stoker	1
Washington	W. Hoyman	32
<u>Seedlings</u>		<u>(Families)</u>
Alberta	S. Molnar	178
Maine	R. Webb	16
North Dakota	R. Johansen	16
<u>Seeds</u>		<u>(Crosses)</u>
Alberta	S. Molnar	20
Colorado	D. Denna	40

PACIFIC NORTHWEST

Dexter R. Douglas and Joseph J. Pavak

Disease Resistance Evaluations

Resistance to Verticillium wilt. Verticillium wilt continues to be one of the most widespread diseases of potatoes in the Pacific Northwest. It is a disease that each farmer has learned to tolerate. Some areas, consisting of light sandy soils, are plagued more than others. The actual damage done by this disease would be hard to estimate.

The evaluation trial was conducted on the Aberdeen Experiment Station where the causal organism is omnipresent. All advanced seedlings in the breeders yield trials were evaluated. These data are summarized in P.N.W. Table 4.

Resistance to Early Blight. Early blight, caused by Alternaria solani (Ell. & Mart.) Soc., is the most serious foliage disease of potatoes in the Pacific Northwest. It is a perennial problem in areas where frequent sprinkler irrigation practices are followed. The amount of acreage involved appears to be increasing annually. This being primarily due to the fact that many formerly gravity irrigated lands are being converted to sprinkler. The tuber infection is a serious problem in the Southeastern section of Idaho. In this area it causes severe annual losses.

The foliar evaluation trial was conducted on the Aberdeen Experiment Station. One hundred and thirty-nine different clones were evaluated. The susceptible variety Pioneer was planted as every third row in the trial. This row was inoculated with a spore suspension of different isolates of the pathogen on July 12, 1971. A solid set sprinkler system was used in the field. To enhance infection, the plot was sprinkled on alternating evenings for two hours just prior to sunset for 10 days after inoculation. For the remainder of the season the plot was irrigated on a normal schedule. The plants were evaluated the last week in August for percentage of leaves infected, size of leaf lesion, size stem lesion, and overall severity. Several selections, A6526-5, A66107-75, A66119-7, A59325-2, and A63136-8, possess acceptable maturity plus a high degree of resistance. These data are summarized in P.N.W. Table 4.

For tuber blight evaluation, the foliage evaluation trial was harvested on September 9, 1971. This was prior to the first killing frost. Most of the infected foliage was still somewhat green at this time. The tubers of the clonal entries in the trial were picked up and placed in mesh bags. These bags were taken to a potato cellar and placed side by side on the floor. Infected vines were placed on top of the bags. Every day for a week the vines were wet down with water. After a week the vines were removed and the bags were stacked in a cellar which was kept at 50° F with 90-95% relative humidity. After four months, the potatoes were evaluated for early blight tuber lesions. Several selection, A66107-44, NDA8257-3, A6680-9, NDA7932-1, and NDA8304-4, appeared to have a high degree of resistance. These data are summarized in P.N.W. Table 4.

Resistance to Streptomyces scabies (Scab). Scab, caused by Streptomyces scabies, is a very serious problem in certain areas of the Pacific Northwest. In fact, considerable acreage has been abandoned to potato production because of it.

The 1971 evaluation trial was planted at Rising River, Idaho. This is an area where the Russet Burbank potato will have at least 70% of the surface area covered with scab lesions. One hundred and fifty-five clones were evaluated. These data are summarized in P.N.W. Table 4.

Several seedlings, A6334-19, A6334-20, A66122-3, A6673-4, and A66107-17, possess a very high degree of resistance to the strain of Streptomyces scabies that is present in the trial area.

Resistance to Rhizoctonia solani Tuber Scurf. The occurrence of black scurf on potato tubers is highly undesirable. This is especially true of the russet type potatoes used for fresh pack purposes. Resistance to this unsightly appearance would be highly desirable.

To evaluate for this disease the potatoes that were harvested in the Rising River scab trial were used. Rhizoctonia solani infection is severe in this area. These data are summarized in P.N.W. Table 4.

Resistance to Corky Ringspot (Tobacco Rattle Virus). This disease has become a serious threat to potato growing, both seed and commercial, in certain areas of Eastern Idaho. It is extremely unpredictable as to where it will appear. It does tend to, however, be restricted to light sandy soil.

In 1971, the first year that an attempt was made to evaluate for possible resistance, 35 clones were planted in a field near Rexburg, Idaho where the disease had been present during 1970. Most of the clones appeared to be extremely susceptible to the disease. One clone, A6382-10, did appear to possess a high degree of resistance. These data are summarized in P.N.W. Table 4.

Resistance to Leafroll Net Necrosis. In 1971, 48 different clones were evaluated for resistance to leafroll net necrosis. The test consisted of 5-hill plots replicated three times. The trial was conducted at the Twin Falls Experiment Station. Viruliferous aphids were used to inoculate the plants in the field on July 15. The plot was harvested October 4, 1971 and the tubers were stored at 60° F. Evaluations on the percentage of tubers exhibiting net necrosis and severity will be made. These data have not been completed to date.

Pacific Northwest Table 4.

Clonal Designation	Maturity	Verticillium Wilt <u>1</u>	Early Blight Foliage <u>2</u>	Early Blight Tuber <u>3</u>	Scab <u>4</u>	Rhizoctonia Tuber Scurf <u>5</u>	Corky Ringspot <u>6</u>
A477-8	3.0	2.4	2.1		5.5	2.0	1.9
A483-6	3.2	2.3	2.6	1.9	5.3	2.0	2.5
A503-42	4.0	.8	.9	.8	5.6	0	2.6
A62180-2	4.1	.7	.7	3.0	2.1	0	3.1
A6305-20	2.9	3.8	3.7	.6	2.0	0	2.7
A6334-19	3.4	1.4	2.2	.6	1.5	1.0	2.9
A6334-20	3.3	1.4	2.1	.7	1.6	0	2.7
A6353-6	5.0	.6	.7	3.0	4.7	0	1.2
A6371-2	3.5	1.8	2.1	1.1	3.3	3.0	1.8
A6371-3	4.0	1.0	2.0	3.2	3.4	0	2.9
A6382-10	2.6	2.1	2.9	1.3	2.9	0	1.0
A63123-7	3.2	1.2	2.4	2.8	4.1	2.0	2.4
A63126-2	3.2	2.2	2.2	3.3	3.3	1.0	2.5
A63126-9	3.5	1.5	2.4	2.6	4.5	2.0	2.7
A63134-45	3.4	1.3	2.5	2.9	2.1	1.0	1.9
A6477-4	4.6	.7	1.3	3.9	2.6	1.0	2.2
A64139-22	3.4	1.5	1.7	1.3	4.1	0	2.9
A64140-3	3.8	1.1	1.5	1.2	4.9	0	1.1
A64187-4	4.4	.6	1.8	3.1	4.7	0	2.8
A64206-4	3.2	1.8	2.6	2.1	2.9	0	3.1
A64206-5	3.9	.8	1.9	1.6	4.7	0	2.5
A6536-5	3.3	1.6	1.2	1.6	5.4	0	2.4
A6673-15	4.3	.6	2.2	1.6	1.9	3.0	2.3
A6698-2	3.6	1.1	1.6	1.2	4.6	3.0	2.3
A66107-44	4.1	.7	1.3	.3	4.7	2.0	2.5
A66107-69	5.0	.4	.8	2.1	3.4	1.0	2.3
A66107-75	4.3	.7	1.3	3.2	2.6	0	2.9
A66107-98	3.5	1.3	1.8	1.5	2.7	2.0	2.3
A66107-101	4.3	.6	.9	1.1	4.5	0	2.6
A66107-116	3.5	1.5	1.8	2.5	2.3	0	2.0
A66107-180	3.5	1.5	1.9	1.1	4.9	0	2.7
A66119-7	4.0	.9	1.7	2.5	2.1	3.0	2.4
A66122-3	3.9	1.3	2.4	1.5	1.6	4.0	2.3
NDA7938-3	3.8	1.1	2.1	1.7	2.0	4.0	2.4
Russet Burbank	3.2	2.3	3.3	2.3	5.2	2.0	2.7
A594-11	3.1	2.2	3.6	2.0	5.3	0	
A5400-15	3.4	2.4	2.9	.8	5.1	0	
A5400-47	4.3	.8	.7	1.2	4.9	0	
A59197-5	4.0	1.3	.8	2.2	4.1	0	
A59325-2	3.8	.8	1.0	2.2	5.2	0	
A6201-37	3.3	2.0	2.3	3.2	3.0	0	
A62155-4	4.3	.9	.9	1.5	3.6	0	
A6334-17	2.7	4.3	3.8	2.8	5.2	2.0	
A6349-21	3.0	3.7	3.0	3.0	5.5	0	
A6351-2	4.4	.9	2.0	3.5	4.0	2.0	

P.N.W. Table 4. Continued.

Clonal Designation	Maturity	Verticillium Wilt ₁	Early Blight Foliage ₂	Early Blight Tuber ₃	Scab ₄	Rhizoctonia Tuber Scurf ₅
A6353-2	4.0	.7	1.3	2.4	3.8	0
A6354-39	3.3	2.6	3.0	3.2	4.3	0
A63184-6	3.1	3.6	3.4	1.4	5.7	0
A6382-4	3.7	1.6	2.9	1.4	4.1	0
A63126-8	3.5	1.6	2.1	2.9	3.4	4.0
A63132-1	2.9	4.8	4.2	2.6	5.1	0
A63134-5	3.3	1.5	2.8	2.1	5.3	1.0
A63136-8	3.9	.9	1.7	3.5	3.8	3.0
A63197-1	3.2	2.0	3.0	1.6	4.9	0
A6442-9	3.4	1.4	1.8	1.1	7.2	0
A64139-20	2.9	1.5	2.3	1.1	5.3	0
A64141-7	3.5	1.7	1.8	1.6	4.0	0
A64158-5	2.9	4.7	3.9	1.1	4.0	2.0
A64159-1	5.0	.4	.3	3.5	4.3	0
A6595-3	2.8	4.8	4.6	.8	3.3	0
A6612-2	3.5	1.4	2.8	2.3	5.5	1.0
A6621-13	4.1	.9	1.8	1.8	5.5	0
A6631-11	4.9	.6	1.0	4.0	3.7	0
A6631-19	4.4	.7	2.3	3.2	4.0	2.0
A6633-1	3.9	1.5	1.6	2.5	5.8	0
A6634-4	4.1	.7	1.6	2.7	5.2	1.0
A6634-13	2.9	2.4	3.0	1.0	2.3	3.0
A6673-3	4.3	.7	3.2	1.2	2.3	2.0
A6673-4	3.0	4.0	3.3	3.1	1.7	3.0
A6680-9	3.1	4.0	3.3	.5	3.2	4.0
A6693-2	3.2	1.7	2.8	3.0	5.3	1.0
A6693-11	3.3	2.3	3.3	1.9	4.4	0
A6695-3	3.3	1.7	2.7	1.2	3.8	0
A6695-5	3.1	2.1	3.1	2.4	5.8	0
A6695-14	3.8	1.4	1.8	2.9	5.9	0
A6696-4	4.1	1.2	1.4	2.6	2.3	0
A6698-4	3.1	1.4	3.1	1.9	1.9	0
A6698-5	3.3	2.7	1.8	1.9	5.4	2.0
A66102-4	3.0	2.9	3.6	.9	3.3	1.0
A66102-5	3.3	1.9	1.9	1.9	5.6	0
A66102-13	3.6	1.2	2.7	2.8	2.4	3.0
A66102-16	3.6	1.1	1.4	2.4	2.6	1.0
A66107-10	2.4	5.0	4.2	2.3	3.0	0
A66107-12	2.8	3.7	3.9	1.6	3.7	1.0
A66107-17	2.8	3.0	3.3	1.7	1.3	1.0
A66107-51	4.3	1.0	1.5	2.8	2.0	0
A66107-80	4.1	1.2	1.1	2.5	2.9	1.0
A66107-151	4.5	.8	1.3	2.2	3.4	0
A66107-172	3.8	1.0	2.3	2.1	5.2	1.0
A66107-169	3.1	3.6	4.3	2.3	2.2	0

P.N.W. Table 4. Continued.

Clonal Designation	Maturity	Verticillium Wilt ₁	Early Blight Foliage ₂	Early Blight Tuber ₃	Scab ₄	Rhizoctonia Tuber ₅ / Scurf ₅
NDA8099-11	2.9		3.8	1.0	3.9	0
NDA8304-4	2.2		4.4	.2	5.4	0
A483-17	4.1		1.7	2.5		
A6713-8	3.0	3.5				
A6715-2	3.7	.9				
A6715-7	4.0	1.3				
A6715-8	3.3	1.2				
A6718-1	4.1	1.2				
A6721-10	4.1	.7				
A6721-16	3.3	2.5				
A6723-12	2.8	4.4				
A6723-14	2.5	3.2				
A6735-1	4.4	.6				
A6745-2	2.8	2.9				
A6746-16	3.1	4.9				
A67771-4	3.3	3.0				
A67771-7	3.0	3.0				
A6787-2	3.1	3.2				
A6789-4	3.0	4.2				
A6789-9	4.0	1.2				
A6791-2	3.2	1.5				
A6794-3	2.9	4.0				
A6795-5	3.4	1.3				
A6795-6	3.0	5.0				
A67102-1	3.4	.9				
A67102-2	4.2	.7				
A67102-4	3.2	1.3				
A67102-8	3.0	2.5				
A67104-4	3.7	1.0				
A67104-5	3.1	3.5				
A67107-1	3.7	1.5				
A67110-5	3.4	3.0				
A67110-6	4.3	1.0				
A67110-7	2.9	2.2				
A67122-1	3.5	1.5				
A67122-11	2.9	1.9				
A67130-5	3.8	1.4				
A67143-3	4.2	1.4				
A67145-6	3.5	1.2				
A67149-1	2.7	4.0				
A67151-3	4.7	.6				
A67158-5	2.9	3.5				
A67168-1	2.9	4.4				
A67168-3	3.3	2.2				
A67171-1	2.9	5.0				

P.N.W. Table 4. Continued.

Clonal Designation	Maturity	Verticillium Wilt ¹	Early Blight Foliage ²	Early Blight Tuber ³	Scab ⁴	Rhizoctonia Tuber Scurf ⁵
A66107-217	3.1	4.2	5.0	1.6	1.8	0
A66110-6	3.1	2.6	2.8	2.6	2.3	1.0
A66110-7	4.5	.6	2.0	1.0	5.5	1.0
A66110-23	3.3	4.6	3.1	3.2	2.4	2.0
A66110-39	3.3	1.2	2.2	2.9	2.0	0
A66122-4	3.7	.8	1.7	3.6	3.9	0
A66123-1	4.3	.9	1.6	3.0	2.8	0
A66133-7	3.8	1.6	2.5	3.8	4.4	0
A7S2-7	3.8	1.0	2.2	3.1	3.4	0
DXW57-2	3.5	1.5	2.6	3.3	4.6	0
DXW58-1	4.1	1.0	1.8	2.3	5.3	0
NDA8134-2	2.7	4.9	4.9	1.4	4.2	0
NDA8139-4	3.7	.9	1.7	3.2	4.0	0
NDA8257-3	2.9	4.3	4.8	.3	1.9	1.0
Wn44-3A	3.4	1.3	2.8	1.8	4.3	0
Shoshoni	3.9	.8	2.0	3.8	2.8	0
A66107-207	3.5	1.2	1.9	2.3	3.4	0
A66110-12	4.4	1.1	1.4	1.7	5.9	0
A66110-25	3.2	2.0	2.5	1.3	5.0	0
A66118-3	3.1	2.7	4.3	2.4	5.2	0
A66133-8	3.6	1.4	2.4	4.1	2.0	0
A5943-1	2.7		4.3	2.8	3.1	0
A6356-6	3.1		4.2	1.8	3.9	0
A63171-1	2.9		3.7	1.4	3.7	0
A6673-1	2.9		3.5	1.7	2.1	2.0
A6673-4	3.0		2.9	3.4	2.0	3.0
A6680-5	2.9		4.0	1.1	5.5	0
A6695-3	3.1		3.1	2.8	3.7	0
A6695-5	2.8		2.8	2.8	5.8	0
A6698-4	2.8		3.2	.7	2.3	1.0
A66107-17	2.8		4.1	1.1	1.8	3.0
A66107-101	2.5		4.7	1.5	2.4	3.0
A66107-172	2.8		3.0	.7	3.5	0
A66107-182	2.6		3.8	.7	2.1	1.0
A66107-197	2.4		4.6	1.2	4.8	0
A66110-2	2.9		3.8	1.6	2.6	0
A66110-7	2.9		4.3	2.2	3.8	1.0
A66110-25	3.3		2.3	1.7	3.8	2.0
A66123-2	2.5		4.1	2.8	5.0	0
NDA7697-2	2.1		5.0	.4	5.0	0
NDA7698-1	2.7		5.0	.5	4.6	0
NDA7746-1	2.2		4.8	1.5	2.3	0
NDA7746-4	3.0		4.3	.6	2.6	0
NDA7919-2	2.9		4.6	.5	5.9	0
NDA7932-1	1.8		5.0	.4	2.7	0

P.N.W. Table 4. Continued.

Clonal Designation	Maturity	Verticillium Wilt
A67284-2	2.8	4.2
A67284-4	3.2	1.7
A67284-7	3.3	2.5
A67303-3	4.1	.7
A67315-6	4.4	.7
A67315-7	4.3	.9
A67341-1A	4.4	1.4
A67341-2A	3.1	1.9
A67341-3	3.3	3.2
A67341-4	3.1	3.9
A67341-5	3.3	1.9
A67341-9A	4.2	.7
A67357-1	3.0	2.5
A67369-8	2.9	3.5
A67372-9	3.1	3.7
A67373-13	3.3	1.4
A67381-3	3.1	3.4
A67385-2	3.9	.7
A67385-3	3.0	2.3
A67385-6	3.1	2.5
A67385-7	4.3	.6
A67386-5	3.2	2.7
A67488-4	3.6	1.2
A67490-2	3.5	1.2
A67490-3	3.1	1.8
A67498-2	3.7	1.7
A67519-2	3.2	2.2
A67525-9	3.2	2.5
A67525-15	2.7	5.0
A68628-6	3.7	1.0
A68629-1A	3.6	1.0
A68637-2	3.4	1.2
A68637-7	3.7	1.7
A68637-9	4.2	.6
A68641-2	3.8	.7
A68641-12	3.1	1.8
A68681-3	3.9	.9
A68715-1	4.3	.7
A68719-2	3.3	2.4
A68721-1	4.2	.6
A68721-2	3.8	2.5
A68730-2	4.2	.9
A68730-3	2.9	4.4
A68730-4	3.8	.7
A68730-7	2.7	4.0

P.N.W. Table 4. Continued.

Clonal Designation	Maturity	Verticillium Wilt ^{1/}	Scab ^{4/}
NDA8460-2	3.3	1.5	
NDA8462-2	2.3	5.0	
NDA8464-2	2.5	3.0	
NDA8505-2	2.9	4.5	
NDA8505-5	3.1	3.4	
NDA8565-2	2.5	4.9	
NDA8572-2	2.8	4.2	
NDA8637-3	3.0	5.0	
A6789-7	3.4	1.5	
JB1-3	4.9	.4	
JB3-1	4.9	.6	
A67488-4	2.9	3.4	
Phureja 243462.A1			4.0
" 320359.A1			1.0
" 320365.A1			1.9
" 320367.A1			1.4
" 320369.A1			1.7
" 320382.A1			1.4
" 320390.A1			1.3
" 320392.A1			1.2
Stenotomum 234013.A1			1.2
Andigena 225629.A1			3.2
" 34773.A1			3.4

1/ 0-5 rating. 0 = resistant and 5 = extremely susceptible.

2/ 0-5 rating. 0 = resistant and 5 = extremely susceptible.

3/ 0-4 rating. 0 = resistant and 4 = extremely susceptible.

4/ 0-6 rating. 0 = no scab, 1 = T-5%, 2 = 5-10%, 3 = 10-20%, 4 = 20-40%,
5 = >40% surface area covered.

5/ 0-4 rating. 0 = no scurf present, 4 = extremely bad.

6/ 0-3 rating. 1 = resistant, 3 = extremely susceptible.

ISRAEL

Marcel Susnoski, James Krikun, Zeev Zuta

Variety and Seedling Trial of Potatoes Resistant to Verticillium dahliae

Twelve varieties and advanced seedlings were tested at the Gilat Experiment Station, in the Negev Region, for resistance to Verticillium dahliae. The tests were conducted on a plot artificially infested with microsclerotia two years before this trial, and on a comparable plot kept free of the fungus. Eight of the varieties were from Beltsville and four from Canada. The control variety was up-to-date, the standard variety grown in the region.

This experiment was conducted under our fall conditions. The tubers were hand planted on August 15, 1970. The experimental design was randomized blocks of 4 replications, 10 hills per replication. The plots were sprinkle irrigated.

The yield from the non-infested plot was harvested after a 120-day growing period, the yield from the infested plot at the end of the vegetative growth. We present the yield results and percent of tubers with vascular discoloration in Table 1. These results are of one season only and the trials are being continued. In this experiment the Ona 2249 was the best variety, producing the same yield on infested as on non-infested soil. At the end of the growing season its foliage was still green although vascular discoloration in the stems was evident. For as yet unknown reason all the other lines which we received as resistant did not prove to be so under our climatic conditions and fungus isolate. Some of the varieties tested did not yield as well as our standard variety on non-infested soil.

Israel Table 1. Yield in kg and number of tubers per plant and percent tubers with vascular discoloration.

	non-infested plot				infested plot				% tubers with	
	Yield		No. Tubers	Tubers	Yield		No. Tubers	Tubers	Vas.	Dis.
	Total	Market. ^{1/}			Total	Market. ^{1/}				
Up-to-Date	1.3 ^a	1.2 ^a	10.1 ^c	7.7 ^{ab}	0.7 ^{de}	0.6 ^{cde}	6.6 ^e	4.0 ^b	48	
B5421-3	0.7 ^{bcd}	0.6 ^{bcd}	6.4 ^b	3.9 ^d	0.6 ^{de}	0.5 ^{de}	6.0 ^b	3.5 ^g	17	
B5458-6	0.6 ^{cd}	0.5 ^{cd}	4.0 ^g	2.7 ^d	0.3 ^g	0.1 ^h	4.0 ^h	0.5 ⁱ	0	
B5415-6	0.8 ^{bc}	0.7 ^{bc}	5.7 ^b	4.2 ^d	0.4 ^g	0.3 ^b	4.5 ^g	3.4 ^g	4	
B5613-6	1.3 ^a	1.1 ^a	11.2 ^b	7.1 ^{ab}	0.8 ^{cd}	0.7 ^c	7.3 ^d	4.5 ^e	18	
B6038-1	1.1 ^a	1.0 ^a	7.9 ^e	5.9 ^c	0.8 ^{bc}	0.8 ^b	6.0 ^b	4.2 ^b	35	
B6138-3	1.1 ^a	1.1 ^a	8.2 ^{de}	7.2 ^{ab}	0.9 ^b	0.6 ^{cd}	8.2 ^b	5.8 ^b	27	
BR5968-4	0.8 ^{bcd}	0.6 ^{bcd}	9.0 ^d	4.2 ^d	0.6 ^{cf}	0.5 ^e	7.6 ^{cd}	3.5 ^g	8	
Ona 2249	1.1 ^a	0.9 ^a	10.4 ^c	6.6 ^b	1.1 ^a	1.0 ^a	8.0 ^{bc}	5.3 ^c	23	
F6110	1.2 ^a	1.0 ^a	11.7 ^{ab}	7.5 ^a	0.7 ^{de}	0.6 ^{cd}	9.9 ^a	6.2 ^a	40	
F6119	1.2 ^a	1.1 ^a	12.6 ^a	7.5 ^a	0.5 ^b	0.4 ^{ef}	7.7 ^{cd}	4.9 ^d	31	
Caribo	0.9 ^b	0.6 ^b	9.4 ^{cd}	3.8 ^d	0.6 ^{ef}	0.4 ^{ef}	7.8 ^{bc}	3.4 ^g	30	
Hunter	0.6 ^d	0.4 ^d	7.7 ^e	3.6 ^{ab}	0.4 ^g	0.3 ^g	6.4 ^{ef}	2.5 ^h	20	

^{1/} Tubers over 60 grams.

^{2/} In tubers 40 grams and over.

The statistical analysis was conducted for each plot separately by means of Q test.

MAINE

R. V. Akeley and J. A. Rowe
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The main objective of the Maine Potato Breeding Program is to develop better adapted and earlier maturing potato varieties with superior yield, cooking and processing qualities. Varieties with round white tubers for the fresh market and for chipping as well as those with long white or russet tubers for baking and french fries are desired.

Potato Crosses

Over 137 crosses and selfed lines among 72 parents were completed during March and April. The parents used had combinations of early maturity, acceptable tuber types and color, high solids, acceptable yields and good processing factors plus resistance to diseases and insects.

Tubers from Potato Seeds

Over 12,000 seedlings representing 47 family lines from the 1970 crosses were grown in 3" pots in the greenhouse at Aroostook Farm. The seedlings were started in mid July, transplanted the first of August, and harvested the last of October.

Masardis Farm

Over 24,000 single-hill seedling tubers from 183 family lines were grown on our isolated farm in Masardis. Approximately 960 were selected for replanting in 12-hill rows in 1972.

Approximately 805 selections from the 1970 single-hill seedlings were planted at Masardis. These selections were evaluated for fertility, maturity and vine vigor. At harvest 96 were saved. These seedlings were evaluated for yield, specific gravity, chip and french fry color, tuber greening and appearance, and resistance to virus X. The yields among the 96 seedlings varied from 137 to 434 cwt. per acre, specific gravity from 1.060 to 1.114, chip color from 7.0 to 10.0 after two weeks of conditioning at 70° F out of 38° F storage and from 6.0 to 10.0 chip color after four weeks at 70° F. Four selections showed no tuber greening after exposure to fluorescent light for 100 hours (A. F. Table 1).

Ninety-seven USDA selections were grown and evaluated for the same characteristics mentioned above except for virus X. Twenty-nine were saved for processing out of storage. The yields varied from 159 to 366 cwt. per acre. specific gravity from 1.057 to 1.089 and chip color from 7.0 to 10.0 after storage at 38° F and conditioned at 70° F for four weeks.

Field Index Plot

A separate field on the Masardis Farm is reserved for maintaining disease free seed sources at the 12-hill seedling increase stage. Single-hill seedlings from the 805 in 12-hill rows in 1971 were planted in 36" rows at 30" spacings. These were screened for the presence of virus X. No infection was found. A disease-free unit of each seedling that is increased from the 12-hill rows will be maintained in the index plot. By roguing for spindle tuber, leafroll, mild mosaic and rugos mosaic if and when it occurs in the field it may be possible to maintain stock free from these common potato diseases.

Seedling Yield Tests

Yield tests in randomized blocks with four replications were grown at Presque Isle, Perham and Masardis. The cultural practices recommended for each location were used. The seed pieces were spaced at 10" in 36" rows. The number of hills per plot were 25, 20, 10, respectively, for Presque Isle, Perham and Masardis.

Dates for planting, vine killing, and harvesting are as follows:

Location	Planting Date	Killing Date	Harvest Date
Presque Isle	June 1	September 14	October 5
Perham	May 25	September 6	September 15
Masardis	May 14	August 25	September 1

The yield, specific gravity, tuber rating and chip color for the selections grown at the three locations are shown in A. F. tables 2 to 10.

A. F. Table 1. Effects of fluorescent light on the relative tuber-greening intensity of 94 seedlings grown at Masardis, Maine, 1971.

Seedling ^{1/}	Greening ^{2/} classes	Seedling	Greening classes	Seedling	Greening ^{3/} class means
CC 01 - 2	2.0 ^{3/}	CC 22 - 3	5.0	CC 71 - 6	1.0
- 3	3.0	- 4	3.0	CC 73 - 1	2.0
- 4	2.0	- 5	3.5	CC 76 - 8	3.0
- 5	3.0	CC 27 - 5	3.0	-12	1.5
- 6	2.0	CC 28 - 2	4.0	CC 81 - 1	3.0
CC 03 - 1	2.0	-12	3.5	AF 51 - 7	4.0
CC 05 - 2	3.0	CC 30 - 1	2.5	AF 11 - 3	1.0
- 4	4.0	CC 31 - 1	3.0	- 8	1.0
CC 06 - 4	4.0	- 4	4.0	-11	2.0
- 8	2.0	CC 32 - 2	2.0	AF 18 - 2	3.5
-12	2.0	- 3	4.0	AF 19 - 3	2.0
-15	3.0	-12	3.0	- 6	2.0
-20	2.5	CC 40 - 3	4.0	AF 23 - 3	3.0
-25	4.0	CC 42 - 2	3.0	AF 24 - 6	2.0
CC 07 - 2	4.0	- 4	2.0	-10	2.0
CC 10 - 3	2.5	- 6	2.0	AF 32 - 8	3.0
- 4	2.5	CC 44 - 2	1.0	AF 40 - 9	4.0
CC 12 - 2	4.0	CC 47 - 2	3.0	AF 41 - 2	4.0
- 7	4.0	CC 51 - 1	2.5	- 3	4.0
-10	4.0	- 8	2.0	-17	3.0
CC 13 - 1	4.0	CC 53 - 7	2.5	AF 66 - 1	1.0
CC 14 - 3	3.5	- 8	4.5	AF 72 -12	3.5
CC 15 - 4	3.5	CC 54 - 3	3.0	AF 76 - 7	4.0
- 6	2.0	- 6	4.0	- 8	5.0
CC 16 - 6	3.5	-21	4.0	AF 82 - 1	3.0
CC 17 - 1	2.5	CC 56 - 6	3.0	AF 84 - 4	3.0
- 8	4.0	CC 57 - 8	2.0	AF 85 - 4	2.0
- 9	5.0	CC 60 - 1	4.0	AF 89 - 8	3.0
-13	5.0	CC 62 - 1	2.0	AF 92 - 3	4.0
CC 19 - 5	4.0	CC 65 - 1	3.0	CC 12 -13	3.0
CC 21 - 2	3.5	- 3	2.0		
- 5	2.0	CC 71 - 2	4.0		

^{1/} Greening classes: 1, none; 2, slight; 3, moderate; 4, intense; 5, very intense.
^{2/} 40 foot-candles of incident light for 100 hour of continuous exposure at 70° F.
^{3/} Means of two samples.

A. F. Table 2. Yield, specific gravity, tuber appearance, and chip color of 16 potato selections at College farm, Presque Isle, season 1971.

Selection	Yield per acre over 2" size		Specific ^{2/} gravity	Tuber ^{3/} appearance	Chip color ^{4/} 2 weeks 4 weeks	
	Cwt.	Pct.	Rating	Rating		
BR6863 - 2 E	372a ^{1/}	97	86	3+	9.5	8.4
Sioux	363ab	98	83	3	10.0	10.0
BR6864 - 7 E	350ab	97	74	3	9.8	10.0
S II 6	349abc	98	72	3	9.5	9.4
BR6864 - 6 E	343a-d	98	71	3	10.0	9.9
BR6864 -11 E	334a-d	97	72	4	10.0	10.0
Katahdin	324bcd	95	77	3+	10.0	9.9
BR6862 - 5 E	318bcd	99	82	3+	9.0	9.0
BR6835 - 1 E	311cd	98	83	3+	10.0	10.0
BR6863 -11 E	309cd	98	96	3	6.6	6.3
BR6863 - 8 E	305cde	98	91	3+	7.6	7.6
Shurchip	299def	97	71	3	9.7	9.8
7 - 11 ND	264ef	94	73	3+	9.9	10.0
Id. Russet	259fg	93	83	2+	10.0	10.0
ND6594 -16	253g	97	73	4	10.0	10.0
York	241g	97	81	3+	10.0	9.9

- 1/ Figure followed by some letters are not significantly different at the 5% level.
- 2/ 1.0 omitted from all ratings.
- 3/ 1 - poor to 5 - excellent.
- 4/ Chip color after storage at 38° and recondition 2 and 4 weeks at 70°. Lower indices indicate lighter color.

A. F. Table 3. Yield, specific gravity, tuber appearance, and chip color of 18 early and medium early maturing potato selections at Perham, Maine, 1971.

Selection	Yield per acre over 2" size		Specific ^{2/} gravity	Tuber ^{3/} appearance	Chip color ^{4/} 2 weeks 4 weeks	
	Cwt.	Pct.	Rating	Rating		
B 6887 -16	457a ^{1/}	96	59	3+	10.0	10.0
BR6820 -15	420ab	91	67	3+	10.0	10.0
B 6887 -12	419ab	96	65	4	10.0	10.0
B 6558 -16	383bc	93	80	3+	10.0	10.0
BR6822 - 5	360c	95	78	3+	10.0	10.0
Norchip	357cd	88	80	3-	8.0	7.6
BR6858 - 2	352cd	97	70	3+	10.0	9.7
BR6456 - 1	345cde	92	72	4	10.0	10.0
BR6831 - 5	304def	96	83	3+	10.0	9.8
B 6516 - 5	294ef	93	84	3	7.2	6.7
B 6553 -31	288f	99	76	4	10.0	10.0
B 6503 - 5	272fg	92	86	3	6.5	5.7
B 6563 - 2	272fg	90	85	4	9.7	10.0
BR6859 - 2	265fg	88	82	4+	9.5	10.0
B 6519 - 3	257fgh	97	74	4	10.0	10.0
BR6491 - 1	251fgh	94	88	3	8.1	7.8
B 6502 - 1	232gh	88	82	3	7.7	7.6
BR6859 - 6	206h	90	85	3	10.0	10.0

^{1/} Figure followed by some letters are not significantly different at the 5% level.

^{2/} 1.0 omitted from all ratings.

^{3/} 1 - poor to 5 - excellent.

^{4/} Chip color after storage at 38° and recondition 2 and 4 weeks at 70°. Lower indices indicate lighter color.

A. F. Table 4. Yield, specific gravity, tuber appearance, and chip color of 24 medium and medium late maturing potato selections at Perham, Maine, 1971.

Selection	Yield per acre over 2" size		Specific ^{2/} gravity	Tuber ^{3/} appearance	Chip color ^{4/} 2 weeks 4 weeks	
	Cwt.	Pct.	Rating	Rating		
BR6887 - 6	586a ^{1/}	97	61	3-	10.0	10.0
BR6879 - 5	452b	95	69	3	10.0	10.0
BR6481 - 3	444b	95	70	3	10.0	10.0
BR6864 - 9	429bc	94	70	4	10.0	10.0
B 6529 -12	427bc	98	73	3+	9.2	8.3
Chippewa	422bcd	93	65	2+	9.9	10.0
BR6820 -29	392b-e	90	72	3	10.0	10.0
B 6782 - 1	391b-e	89	63	3	10.0	10.0
BR6871 - 5	381cde	89	67	3+	10.0	10.0
BR6490 - 1	376c-f	95	72	3-	10.0	10.0
B 6547 - 7	365d-g	96	67	3+	10.0	10.0
B 6581 -17	361d-g	93	74	3	10.0	10.0
B 6527 -33	349e-h	91	82	3	9.4	8.6
B 6518 - 8	319fgh	79	84	3+	9.2	10.0
B 6518 - 2	307ghi	86	81	3+	9.7	9.6
B 6516 -15	293hij	93	84	3+	8.9	7.5
BR6463 - 1	291hij	93	77	3+	10.0	10.0
B 6712 -23	290hij	96	80	4	8.7	8.4
B 6518 - 5	278ij	80	82	3+	9.7	9.4
BR6479 - 1	272ij	85	73	3+	10.0	10.0
BR6858 - 5	271ij	92	72	3-	10.0	10.0
BR6491 - 9	242j	91	91	4	8.6	8.6
B 6712 -18	240j	86	73	3	9.5	9.6
B 6516 - 3	233j	84	87	3+	9.4	8.7

^{1/} Figure followed by some letters are not significantly different at the 5% level.

^{2/} 1.0 omitted from all ratings

^{3/} 1 - poor to 5 - excellent

^{4/} Chip color after storage at 38° and recondition 2 and 4 weeks at 70°. Lower indices indicate lighter color.

A. F. Table 5. Yield, specific gravity, tuber appearance and chip color of 16 late and very late maturing potato selections at Perham, Maine, 1971.

Selection	Yield per acre over 2" size		Specific ^{2/} gravity	Tuber ^{3/} appearance	Chip color ^{4/} 2 weeks 4 weeks	
	Cwt.	Pct.	rating	rating		
B 6741 -17	423a ^{1/}	95	59	3	10.0	10.0
B 6518 - 4	383ab	96	70	3+	10.0	10.0
Wauseon	362bc	94	68	3	9.9	9.5
BR6626 - 5	353bcd	95	71	4	10.0	10.0
B 6532 - 4	336bcd	95	79	3+	9.5	9.3
B 6537 - 4	329cde	94	77	3+	10.0	10.0
B 6597 -20	318c-f	94	70	4	10.0	10.0
BR6834 - 1	317c-f	91	68	3	10.0	10.0
B 6692 -11	310def	96	58	3	10.0	10.0
B 6548 - 1	281c-fg	93	59	2	10.0	10.0
B 6887 - 5	275fg	97	57	3	10.0	10.0
B 6745 - 6	262g	87	64	3	10.0	10.0
BR6493 -14	246g	99	62	4	10.0	10.0
BR6491 - 2	242g	94	83	3-	9.7	9.3
BR6491 - 5	241g	83	86	3	9.5	9.2
B 6516 -20	183h	87	84	3	9.5	9.1

^{1/} Figure followed by some letters are not significantly different at the 5% level.

^{2/} 1.0 omitted from all rating.

^{3/} 1 - poor to 5 - excellent

^{4/} Chip color after storage at 38° and recondition 2 and 4 weeks at 70°. Lower indices indicate lighter color.

A.F. Table 6. Yield, specific gravity, tuber appearance, and chip color of 17 early maturing potato selections at Masardis, Maine, 1971.^{1/}

Selection	Yield per acre over 2" size		Specific ^{2/} gravity	Tuber ^{3/} appearance	Chip color ^{4/} 2 weeks 4 weeks	
	Cwt	Pct	Rating	Rating		
B 7007 -19	300a	97	73	3	10.0	9.5
B 7025 -17	276ab	92	75	3	10.0	10.0
B 6957 - 2	266ab	90	75	3	9.1	8.5
Norland	261abc	92	77	4+	9.8	9.8
BR7093 - 6	251bcd	93	85	3-	9.5	8.2
B 7008 - 4	249bcd	86	79	4	10.0	10.0
B 7008 - 3	246bcd	79	72	3+	9.1	7.7
BR7061 - 4	240bcd	88	78	3	10.0	10.0
BR7082 - 2	234b-e	84	86	3	9.8	10.0
BR7049 - 4	230b-f	85	82	4	10.0	10.0
BR7062 - 1	216c-g	80	83	3+	10.0	9.5
B 7008 -17	206d-g	84	72	3+	9.3	7.8
B 7029 - 8	190e-h	97	76	4	10.0	10.0
B 6987 -62	185fgh	91	82	3+	9.0	7.1
B 7025 -23	178gh	83	74	3+	10.0	10.0
B 6969 - 1	176gh	73	75	4	10.0	10.0
BR7097 - 2	152h	76	87	4	9.0	7.2

^{1/} Figure followed by some letters are not significantly different at the 5% level.

^{2/} 1.0 omitted from all rating.

^{3/} 1 - poor to 5 - excellent

^{4/} Chip color after storage at 38° and recondition 2 and 4 weeks at 70°. Lower indices indicate lighter color.

A.F. Table 7. Yield, specific gravity, tuber appearance and chip color of 27 medium early maturing potato selections at Masardis, Maine, 1971.^{1/}

Selection	Yield per acre over 2" size		Specific ^{2/} gravity	Tuber ^{3/} appearance	Chip color ^{4/} 2 weeks 4 weeks	
	Cwt.	Pct	Rating	Rating		
B 6953 - 1	362a	92	67	4	10.0	10.0
B 6974 - 8	341ab	93	74	3+	10.0	10.0
BR7045 - 4	336abc	94	74	4	10.0	10.0
B 6934 - 9	333abc	90	78	4	10.0	10.0
BR7093 -20	331a-d	94	82	3	8.3	8.1
BR7025 -26	318a-e	92	74	3+	10.0	10.0
B 6955 - 5	313a-f	95	77	4	10.0	8.2
B 6987 -34	310a-g	96	83	3+	10.0	8.5
BR7093 - 2	306a-g	96	90	3+	9.0	10.0
B 6930 -23	295b-h	90	82	3+	10.0	9.0
BR7075 - 8	287b-i	87	82	3	10.0	10.0
B 6967 - 2	278b-j	88	77	4	10.0	10.0
B 6987 -18	274c-j	94	75	3	10.0	7.6
BR7111 - 1	268d-k	93	93	3	9.9	8.2
B 6990 -14	264e-k	96	83	3	10.0	10.0
BR7093 -12	258e-k	91	87	3+	6.4	5.4
BR7082 - 7	254e-k	84	86	3	10.0	10.0
B 5616 - 4	248f-k	91	87	3+	7.5	5.0
I. Cobbler	247g-k	87	84	3-	10.0	9.3
B 6955 -17	246g-k	85	87	4	9.9	9.8
B 6952 -10	245g-k	92	95	3	7.7	5.8
BR7094 -11	234h-k	87	82	4	10.0	9.4
B 6987 -57	226ijk	94	84	3+	9.4	5.7
BR7093 -23	213jk	97	75	4	8.5	8.5
B 6930 -25	213jk	93	67	4	10.0	10.0
B 6930 -27	212jk	75	77	3	10.0	10.0
B 6955 -35	202k	77	86	3-	7.7	5.9

^{1/} Figure followed by some letters are not significantly different at the 5% level.

^{2/} 1.0 omitted from all rating.

^{3/} 1 - poor to 5 - excellent.

^{4/} Chip color after storage at 38° and recondition 2 and 4 weeks at 70°. Lower indices indicate lighter color.

A. F. Table 8. Yield, specific gravity, tuber appearance and chip color of 33 medium maturing potato selections at Masardis, Maine, 1971.^{1/}

Selections	Yield per acre over 2" size		Specific ^{2/} gravity	Tuber ^{3/} appearance	Chip color ^{4/} 2 weeks 4 weeks	
	Cwt	Pct	Rating	Rating		
B 7024 -17	342a	96	89	3+	10.0	8.6
B 6951 - 5	330ab	88	80	4	10.0	9.0
BR7068 - 3	329ab	97	85	4+	10.0	10.0
B 7024 - 6	323abc	92	90	3	9.0	8.3
BR7103 - 1	320a-d	86	81	4	9.5	9.8
BR7099 - 8	312a-e	92	76	4	10.0	9.8
BR7093 - 4	311a-e	92	84	3+	9.4	9.2
Chippewa	299a-f	92	66	3	10.0	10.0
BR7098 - 2	295a-f	93	78	3	9.8	8.7
B 6936 -39	286a-g	91	89	3	10.0	9.5
B 6930 -16	285a-g	89	76	4	10.0	9.5
B 7033 -33	283a-g	93	89	3+	10.0	9.7
B 6936 -32	271b-h	97	87	3+	10.0	9.1
B 6990 -19	268b-h	93	86	3+	10.0	10.0
BR7105 - 9	260c-h	81	86	3+	9.5	8.5
BR7044 - 2	259d-h	89	87	4	10.0	10.0
B 6936 -29	256e-i	94	94	3	10.0	8.1
B 6936 -16	251e-j	96	99	4	6.7	5.5
B 6930 -11	251e-j	85	80	4	10.0	10.0
B 6955 -10	250e-j	94	92	4	9.9	7.9
BR7101 - 4	249e-j	85	87	3+	8.9	7.2
BR7051 - 4	248e-j	79	90	4	10.0	8.8
BR7105 - 4	246f-j	96	85	4	10.0	9.8
BR7111 - 3	240f-j	90	84	3+	10.0	10.0
BR7089 - 2	235f-k	86	80	3+	9.4	8.3
B 6705 - 3	224g-k	92	85	3+	9.5	8.9
BR7083 - 1	224g-k	75	94	4	9.5	9.8
B 6705 -15	215h-l	81	83	4	10.0	9.4
B 6955 - 9	193i-m	88	92	3	8.9	6.0
B 6936 -28	190j-m	76	95	4	9.5	8.0
B 6553 - 8	175j-m	88	87	3	9.8	9.6
B 6955 -29	157lm	66	98	3	7.2	7.0
B 6955 -27	148m	95	92	3-	9.4	7.8

^{1/} Figure followed by some letters are not significantly different at the 5% level.

^{2/} 1.0 omitted from all rating.

^{3/} 1 - poor to 5 - excellent.

^{4/} Chip color after storage at 38° and recondition 2 and 4 weeks at 70°. Lower indices indicate lighter color.

A. F. Table 9. Yield, specific gravity, tuber appearance and chip color of 26 medium late maturing potato selections at Masardis, Maine, 1971^{1/}.

Selection	Yield per acre over 2" size		Specific ^{2/} gravity	Tuber ^{3/} appearance	Chip color ^{4/} 2 weeks 4 weeks	
	Cwt	Pct	Rating	Rating		
B 6985 - 7	347a	96	87	3+	9.5	10.0
B 6931 - 1	340ab	94	77	3-	10.0	10.0
B 6987 -31	300abc	93	88	3	10.0	9.8
BR7102 - 4	294a-d	93	84	3+	10.0	10.0
B 7033 -17	293a-e	90	87	3	8.9	8.1
B 6968 - 1	291a-e	96	73	3	10.0	10.0
BR7089 - 1	284a-f	93	87	3	9.8	9.5
Kennebec	282a-f	95	78	3+	9.5	8.7
B 6986 - 2	281a-f	97	87	3	8.3	8.3
BR7093 -14	280a-f	98	82	3	10.0	9.0
B 6930 -22	274a-f	92	65	3	10.0	10.0
B 6970 -12	271a-f	95	67	3	10.0	10.0
BR7116 - 1	268a-f	94	80	3+	10.0	9.8
BR7079 - 8	268a-f	96	75	3+	10.0	9.4
BR7085 - 1	265b-f	73	88	3+	10.0	10.0
B 6936 -22	264b-f	85	78	3+	10.0	10.0
B 6987 -56	257c-f	91	89	4	8.5	5.5
B 6967 - 9	256c-f	88	81	4	10.0	10.0
BR7058 - 3	240c-f	94	72	3	10.0	10.0
B 6955 -14	220c-g	88	85	3-	10.0	8.5
BR7086 - 4	220d-g	95	78	3	10.0	9.3
B 7033 - 6	219d-g	90	87	3	8.5	7.4
B 6712 -20	211d-g	83	92	3	7.7	5.8
B 6929 -14	210efg	83	75	3+	10.0	10.0
B 7033 - 1	206fg	94	93	3	7.3	6.0
BR7099 - 7	143g	70	84	4+	8.7	8.3

^{1/} Figure followed by some letters are not significantly different at the 5% level.

^{2/} 1.0 omitted from all rating.

^{3/} 1 - poor to 5 - excellent.

^{4/} Chip color after storage at 38° and recondition 2 and 4 weeks at 70°. Lower indices indicate lighter color.

A. F. Table 10. Yield, specific gravity, tuber appearance and chip color of 18 late and very late maturing potato selections at Masardis, Maine, 1971.^{1/}

Selections	Yield per acre over 2" size		Specific ^{2/} gravity	Tuber ^{3/} appearance	Chip color ^{4/} 2 weeks 4 weeks	
	Cwt	Pct	Rating	Rating		
B 6980 - 8	436a	95	68	3+	10.0	10.0
BR7085 - 5	342b	97	77	3	10.0	10.0
BR7103 - 2	342b	94	85	4	10.0	9.0
BR7108 - 3	335bc	97	82	4	9.9	9.5
B 6974 -17	327bcd	91	73	3	10.0	10.0
B 6987 - 7	316b-e	94	83	3	10.0	8.2
B 6944 - 5	312b-e	92	71	3+	10.0	10.0
B 6930 - 6	301b-e	90	74	3	10.0	10.0
B 6987 -43	291b-f	97	84	3	8.9	5.0
B 6952 - 3	288b-f	83	86	3+	9.5	8.5
BR7105 -10	274b-f	86	75	4	10.0	8.6
B 7094 - 2	268b-f	84	81	3	8.7	8.4
B 6955 -32	265b-f	96	86	3+	9.0	7.5
B 6936 -24	258b-f	94	91	3	10.0	10.0
B 6987 -44	246c-f	97	88	3+	10.0	9.0
BR7051 - 3	239def	92	93	3+	7.5	7.9
BR7072 -12	231df	87	79	4	10.0	10.0
BR7091 - 3	202f	68	84	4	10.0	10.0

^{1/} Figure followed by some letters are not significantly different at the 5% level.

^{2/} 1.0 omitted from all rating.

^{3/} 1 - poor to 5 - excellent

^{4/} Chip color after storage at 38° and recondition 2 and 4 weeks at 70°. Lower indices indicate lighter color.

MAINE

D. C. Merriam and F. E. Manzer

Ring Rot Resistance

The results of these annual tests are reported one year behind in order that tubers of selections appearing disease-free or questionable in the field can be checked after a storage period of five or six months. As in recent years these tests are conducted only on selections shown in previous plantings to have commercial promise. Entries are replicated four times (unless otherwise noted) in five-hill lots and inoculation is accomplished by dipping freshly cut seedpieces in a slurry made by grinding the vascular tissue of diseased tubers. Katahdin is used as the susceptible check unless otherwise stated.

1969. Results of tests in this year were inadvertently not submitted for the Annual Report. The trial included a total of 56 seedlings from 39 crosses, and those showing a low amount of disease are recorded below (Maine Table 1.). None of the Katahdin checks showed low disease incidence.

Maine Table 1. Advanced selections showing low disease incidence in ring rot inoculation tests--1969.

Amount of disease by replication^{1/}

Pedigree Number	I		II		III		IV	
	Plants	Tubers	Plants	Tubers	Plants	Tubers	Plants	Tubers
BR6442-1	0/5	5/20	0/5	2/16	2/5	6/18	1/5	4/21
B 6516-27	1/5	4/5	2/5	6/17	2/5	5/20	1/5	3/17
B 6519-5	0/5	2/19	1/5	4/20	1/5	3/23	0/5	2/14
B 6519-6	0/5	3/15	1/5	4/5	2/5	6/18	2/5	8/20
B 6529-21	2/5	8/26	1/5	13/20	2/5	6/22	0/5	4/19
B 6530-4	0/5	3/17	1/5	4/15	1/5	4/21	4/5	--
B 6547-7	1/5	0/31	0/5	0/40	2/5	--	0/5	0/45
B 6548-1	4/5	--	0/5	3/30	1/5	4/28	2/5	--
B 6562-22	2/5	--	1/5	4/28	2/5	--	0/5	3/31
B 6567-12	0/5	1/36	0/5	3/34	0/5	4/28	1/5	3/32
B 6587-8	0/5	2/27	2/5	--	1/5	2/40	1/5	4/36
B 6569-7	0/5	2/34	0/5	0/42?	1/5?	0/38	0/5	0/28

^{1/} Numerator = number diseased.

Denominator = number examined.

1970. Results of the trial in this year included a total of 125 seedlings from 35 crosses. Kennebec was used as the susceptible check while Teton and Wy. Sdlg. 1122 served as resistant checks. Those sections showing low disease incidence are recorded below (Maine Table 2.).

Maine Table 2. Advanced selections showing low disease incidence in ring rot inoculation tests--1970.

Amount of disease by replication^{1/}

Pedigree Number	I		II	
	Plants	Tubers	Plants	Tubers
B 6682-2	2/5	--	0/5	4/20
B 6695-1	0/5	3/17	0/5	5/19
B 6705-12	0/5	6/24	3/5	--
B 6718-8	1/5	2/17	0/5	6/20
B 6727-5	2/5	--	?/5	--
B 6739-1	1/5	6/24	1/5	4/18
B 6759-3	0/5	1/16	0/5	3/27
B 6761-1	1/2	4/20	?/5	5/18
B 6764-2	0/5	0/18	0/2	0/12
B 6782-1	0/2	2/14	2/4	--
B 6814-16	0/5	9/16	0/5	0/22
BR6858-5	0/5	0/18	1/4	0/15
B 6879-11	0/5	1/19	?/5	2/34
BR6480-3	0/5	0/33	?/5	0/25
Wy. Sdlg. 1122	0/5	0/17	0/5	0/28
Teton	2/5	--	?/5	4/20
Kennebec	4/5	--	5/5	--

^{1/}

Numerator - number diseased.

Denominator = number examined.

MAINE

D. C. Merriam and F. E. Manzer

Spindle Tuber Resistance

Annual progress summaries of this work are delayed one year because of the necessity for replanting inoculated seedlings to obtain disease readings. As in recent years only selections showing commercial promise in previous plantings are included. Entries are inoculated by the top-switching method in four, two-hill lots and a tuber from each hill is harvested for the disease reading.

1969. Results of this trial were inadvertently not submitted for the Annual Report. A total of 56 seedlings from 39 crosses were inoculated and all entries including the Green Mountain and Mohawk susceptible checks showed a high incidence of disease in 1970.

1970. A total of 125 seedlings from 35 crosses were inoculated in this trial, and all entries including Green Mountain and Mohawk susceptible checks showed a high incidence of disease in 1971.

MAINE

Hugh J. Murphy and Michael J. Goven

Cooperative variety trials with 26 entries were conducted during 1971, at Presque Isle, Washburn, and Exeter, Maine. Weather and soil conditions were excellent for early planting. Rainfall distribution was near perfect for high yields. Growing conditions were close to ideal during the entire growing season of 1971.

Plots at all test locations were single rows, 25 feet long, with six replicates per variety. Planting, killing, and harvest dates, seed-piece spacing, and fertilizer used at each location are presented in Maine Table 5.

Yields and specific gravities for the varieties grown at all Maine locations are presented in Maine Table 1. BR6312-2, BR6097-9, B6356-1, BR5957-7, BR5960-13, and F5810 were among the top yielding seedlings; whereas Cascade, Oromonte, Desiree, and Kennebec were top yielders for named varieties. The five high varieties in specific gravity were Norchip, Seminole, BR5960-5, BR5960-13, and F5810. Relatively few varieties were below 1.075, the acceptable limit for processing in Maine.

Size determinations for two market size classes are presented in Maine Table 2. Most of the varieties grown at Presque Isle and Exeter produced high percentages of tubers in the larger size classes because of the ideal growing conditions. Medium and late maturing varieties grown at Washburn did not size up well because they were killed early to reduce late blight tuber rot.

Results of the first chipping and french fry tests are presented in Maine Tables 3 and 4, respectively. Seven of the 26 varieties at Presque Isle had satisfactory chip color (7.0 or less). Four of the 26 grown at Washburn had satisfactory chip color. At Exeter in Central Maine, however, 20 of the 26 varieties made light colored chips. Practically all varieties tested at Presque Isle made satisfactory french fry color (3.0 or less). Two varieties, BR6312-2 and BR6263-2, were unsatisfactory in french fry texture.

Many more detailed studies were conducted with the varieties grown in Maine tests during 1971. For further information consult the annual Maine, New Hampshire, Vermont Potato Variety Trial Report available from Public Information and Central Services, University of Maine, Orono, Maine 04473.

Maine Table 1. Yield and specific gravity of potato varieties grown at three locations in Maine - 1971.

Variety	Presque Isle		Washburn		Exeter	
	Yield	Specific	Yield	Specific	Yield	Specific
	Cwt./A.	Gravity	Cwt./A.	Gravity	Cwt./A.	Gravity
Cascade	444	1.081	343	1.072	509	1.084
Cobbler	351	1.088	279	1.080	424	1.082
Desiree	468	1.076	334	1.072	480	1.072
Katahdin	411	1.082	303	1.073	432	1.075
Kennebec	451	1.084	378	1.078	457	1.086
Norchip	361	1.089	253	1.081	400	1.088
Oromonte	478	1.092	326	1.079	493	1.085
Russet Burbank	398	1.090	291	1.077	362	1.086
Seminole	294	1.092	224	1.088	281	1.087
B5665-7	371	1.091	273	1.085	329	1.086
B6024-3	419	1.075	317	1.070	373	1.071
B6039-1	344	1.084	282	1.074	384	1.086
B6044-14	443	1.088	316	1.080	392	1.088
B6097-9	461	1.087	335	1.078	446	1.084
B6356-1	408	1.060	365	1.059	362	1.060
B6376-6	406	1.087	288	1.081	381	1.080
BR5957-7	458	1.086	320	1.072	373	1.079
BR5960-5	442	1.093	328	1.084	404	1.085
BR5960-13	422	1.092	273	1.083	514	1.086
BR6263-2	401	1.078	307	1.073	359	1.073
BR6306-22	398	1.074	289	1.068	415	1.067
BR6312-2	580	1.069	378	1.062	688	1.065
BR6316-5	385	1.088	279	1.078	404	1.091
F5810	396	1.090	321	1.079	505	1.094
F59103	376	1.082	312	1.076	426	1.073
RD311	351	1.088	291	1.084	330	1.082

Maine Table 2. Percentage of yield between 1-7/8 and 4 inches in diameter for varieties grown at three locations in Maine - 1971.

Variety	Presque Isle		Washburn		Exeter	
	1-7/8	2-1/4	1-7/8	2-1/4	1-7/8	2-1/4
	to 4 inches	to 4 inches	to 4 inches	to 4 inches	to 4 inches	to 4 inches
Cascade	95.4	74.0	93.3	68.0	92.7	79.5
Cobbler	95.1	71.6	87.6	45.6	95.5	81.9
Desiree	74.2	72.2	95.4	89.3	76.3	73.1
Katahdin	97.3	88.8	94.8	73.1	95.2	88.5
Kennebec	95.7	88.4	96.6	80.5	97.7	90.6
Norchip	93.2	57.7	84.3	37.8	95.4	75.9
Oromonte	95.7	83.3	90.6	63.0	90.9	81.7
Russet Burbank	62.2% 4 - 10 oz.		42.1% 4 - 10 oz.		58.9% 4 - 10 oz.	
Seminole	98.1	91.5	96.7	77.9	96.7	85.0
B5665-7	97.0	85.7	95.0	70.2	97.2	87.5
B6024-3	97.2	73.2	89.8	48.8	96.8	81.6
B6039-1	92.7	51.7	84.8	28.1	93.0	72.3
B6044-14	97.0	84.4	91.8	60.3	96.4	84.4
B6097-9	96.5	77.1	89.3	52.6	94.0	76.5
B6356-1	97.3	91.7	96.8	82.8	97.2	89.9
B6376-6	96.0	87.3	95.0	75.0	94.4	87.4
BR5957-7	98.2	89.4	94.9	67.5	95.7	83.7
BR5960-5	94.8	84.5	92.2	65.9	95.8	84.5
BR5960-13	97.1	91.0	94.8	69.8	91.8	87.3
BR6263-2	96.3	79.7	90.2	48.2	94.9	73.6
BR6306-22	97.4	81.8	95.0	70.7	96.8	80.6
BR6312-2	94.8	89.2	93.5	69.3	89.3	81.9
BR6316-5	97.7	85.1	95.7	76.2	94.6	83.0
F5810	95.2	81.3	92.0	64.4	93.7	83.7
F59103	98.5	90.7	96.8	82.7	87.6	81.8
RD311	97.1	89.2	94.5	72.9	95.6	86.0

Maine Table 3. Chip color indices for potato varieties grown at three locations in Maine - 1971¹

Variety	Presque Isle	Washburn	Exeter
Cascade	8.7	8.8	6.1
Cobbler	8.1	7.8	6.1
Desiree	9.4	9.8	8.3
Katahdin	8.5	9.9	7.4
Kennebec	6.9	7.0	5.8
Norchip	5.2	5.3	3.5
Oromonte	7.8	9.3	6.7
Russet Burbank	8.1	9.5	6.2
Seminole	6.4	5.9	3.6
B5665-7	6.5	6.3	4.6
B6024-3	7.7	7.9	6.2
B6039-1	7.4	7.5	3.6
B6044-14	8.4	8.6	6.6
B6097-9	6.8	8.5	6.8
B6356-1	10.0	10.0	10.0
B6376-6	7.4	7.9	7.1
BR5957-7	7.5	8.2	6.0
BR5960-5	7.9	8.2	5.7
BR5960-13	5.6	5.9	5.0
BR6263-2	7.5	8.9	6.3
BR6306-22	7.1	7.3	5.1
BR6312-2	10.0	10.0	10.0
BR6316-5	7.3	7.9	3.7
F5810	8.3	8.9	7.1
F59103	7.2	7.5	5.1
RD311	5.8	4.7	3.5

¹Chips with lower indices are lighter in color.

Maine Table 4. French fry color and texture indices for potato varieties grown at Presque Isle, Maine - 1971¹

Variety	Color Index ¹	Texture Index ²
Cascade	4.0	1.1
Cobbler	2.3	1.0
Desiree	3.3	1.0
Katahdin	2.8	1.0
Kennebec	1.3	1.0
Norchip	1.0	1.0
Oromonte	1.7	1.1
Russet Burbank	2.1	1.1
Seminole	1.1	1.0
B5665-7	1.1	1.0
B6024-3	1.6	1.1
B6039-1	1.8	1.0
B6044-14	2.9	1.0
B6097-9	2.0	1.1
B6356-1	4.0	1.2
B6376-6	1.5	1.0
BR5957-7	1.4	1.0
BR5960-5	2.2	1.0
BR5960-13	1.0	1.0
BR6263-2	2.5	1.6
BR6306-22	1.8	1.0
BR6312-2	5.0	1.5
BR6316-5	1.3	1.0
F5810	2.3	1.0
F59103	1.3	1.0
RD311	1.5	1.0

¹French fries with lower index numbers are lighter in color.

²Lower texture indices indicate mealier texture.

Maine Table 5. Pertinent information about Maine Cooperative Potato Variety Trials - 1971.

	Presque Isle	Washburn	Exeter
<u>Planted</u>			
	May 15	May 13	May 26
<u>Killed</u>			
Early varieties	Aug. 24	Aug. 24 ¹	Sept. 4
Medium varieties	Sept. 3		Sept. 14
Late varieties	Sept. 13		Sept. 24
<u>Harvested</u>			
Early varieties	Sept. 3	Sept. 4 ¹	Sept. 14
Medium varieties	Sept. 13		Sept. 24
Late varieties	Sept. 23		Oct. 4
<u>Fertilization</u>			
(Pounds per Acre)	130-130-130	130-130-130	130-130-130
<u>Seedpiece Spacing</u>			
	<u>2</u>	<u>2</u>	<u>2</u>

¹Killing and harvesting for all varieties done on same date because of a late blight problem at this location.

²Seedpieces of Norchip spaced 10 inches apart; Russet Burbank and Desiree spaced 16 inches apart; all other varieties 8 inches.

MARYLAND

James G. Kantzes

Results of Potato Variety Trials on the Eastern Shore of Maryland

The potato trials were located at the University of Maryland Vegetable Research Farm near Salisbury, Maryland. The seed were planted on March 18. The harvest date was August 9.

Maryland Table 1. Yield of Potato Varieties Grown at Salisbury, Maryland

Variety	Total Yield (Cwt/A)	Vine Maturity ^{1/}
B 6564-9	152	6
B 6603-6	152	9
B 656-14	89	7
B 6495-10	218	9
B 6532-14	581	6
B 6516-36	215	9
B 5698-8	219	7
B 6595-12	51	9
B 6503-5	213	7
B 6516-20	238	10
B 6532-4	221	9
F 6516-3	190	4
B 6567-27	134	3
F 6526-10	186	7
B 6603-12	245	10
B 5647-8	141	2
F 5665-7	242	4
Kennebec	256	10
Katahdin	252	8

^{1/} Vines rated for maturity July 27, 1971, 1-10: 1 = completely dead;
10 = completely green.

MICHIGAN

N. R. Thompson and R. W. Chase

Potato Breeding

Segregating Populations. First year seedlings comprised 4200 individual cultivars from nine cross pollinations and one self-fertilized family. After a very slow start, growth was rapid and vigorous. The appearance of aphids required that the vines be killed September 6 when 20 percent of the plants were still in full bloom. This immaturity accounted for the lower than anticipated specific gravity of many cultivars. However, in the first year with only one hill of a cultivar it is essential that the spread of viruses be controlled or many good cultivars will be lost.

Shape, size, and general appearance was exceptionally good and a greater than normal number were retained. Quality studies, i.e., total solids, chip color, and storage tests will determine the cultivars to be planted in 1972. If the random sampling of 50 selections (Table 1) from each cross is representative between 2500 and 3000 will be saved.

Michigan Table 1. Average performance of 50 randomly selected samples from 10 segregating seedling populations, 1971.

Cross		Yields lbs/hill			Specific gravity			Chip color		
No.	Parentage	Low	Av.	High	Low	Av.	High	Low	Av.	High
001	320-6 x 709	0.18	1.7	4.7	1.062	1.075	1.083	1	3.8	7
002	321-38 x 709	0.26	1.6	3.8	1.067	1.082	1.143	2	3.5	6
003	321-65 x 709	0.17	1.9	5.7	1.074	1.089	1.144	1	3.1	6
004	321-70 x 709	1.4	2.4	4.5	1.061	1.075	1.087	2	4.3	7
005	706-34 x 709	0.85	2.5	6.5	1.054	1.073	1.089	1	3.9	8
006	706-34 x 706-32	0.79	2.6	5.1	1.059	1.070	1.089	1	4.8	7
007	706-34 x 711-8	1.05	2.4	5.2	1.048	1.067	1.082	1	4.0	8
008	706-34 x 735-1	1.32	3.0	6.0	1.054	1.068	1.083	3	5.7	9
009*	709 x	0.89	2.3	4.5	1.060	1.071	1.080	3	5.0	6
010	711-8 x 735-1	1.01	2.4	4.6	1.049	1.071	1.090	1	4.8	9
Av.			2.28						4.29	

*7 samples only

The continued backcrossing of the S. stoloniferum hybrids seems to have eliminated the wild characteristics while retaining the high total solids and chip quality. Shape and yield of the S. tuberosum parent was clearly evident in the progeny. These seedlings will be analyzed for protein and methionine. Methionine is the essential amino acid which most commonly limits the total nutritive value of the potato. Protein and methionine content of the parental clones is presented in Table 2. Several S₂ selections from an inbred population of the variety Merrimack are shown in Table 3. Five thousand new cultivars of similar genetic background have been grown in the greenhouse for planting in 1972.

Michigan Table 2. Kjeldahl protein and methionine of parental clones, 1971.

Cultivar	Protein %N x 6.25/d. m.	Available Methionine % met/N x 6.25
735-1	9.2	1.05
321-38	14.4	1.25
321-70	13.0	1.45
320-6	10.8	1.20
706-34	15.2	1.45
709	9.5	1.25
371-65	7.8	1.1
711-8	12.6	1.35

Michigan Table 3. Inbred Merrimack population, 1971.

Cultivar	Protein %N x 6.25/d. m.	Available Methionine % met/N x 6.25
854-1	11.6	2.5
852-18	10.1	2.3
854-28	14.7	1.8
864-56	12.5	2.25
866-7	11.8	1.8
866-13	10.1	1.61
864-19	11.2	1.19
Merr. 114	12.2	1.40
Merr. 132	11.6	1.54
Merr. 249	15.1	1.55

Merr. 249, yielding 29,200 lbs/acre with a protein content of 3.5 percent on a fresh weight basis yielded 1022 lbs protein per acre.

Advanced Clones

For varietal potential 35 cultivars were evaluated. Ten hills of each were dug early for seed increase. The balance were killed September 6 and harvested for yield quality and storage studies, Table 4.

Chipping tests in January after reconditioning from 45° F storage, dormancy, baking, boiling and french frying will determine which of the cultivars will be screened for diseases in the greenhouse prior to increase on the Coleman Farms, Marquette.

Michigan Table 4. Advanced seedling clones, Montcalm Farm, 1971.

Clone No.	Yield, cwt/A US #1 B's		Total	Specific Gravity	Chip Color
735-1	866	00	866	1.076	5
706-34	736	28	764	1.063	8
613-18	616	51	667	1.064	5
859-144	585	30	615	1.079	5
321-101*	513	102	615	1.083	2
706-1	533	60	593	1.074	2
711-8	543	29	572	1.068	4
645-1	508	41	549	1.075	2
613-20	462	77	539	1.074	2
645-2	508	30	538	1.074	2
321-30*	462	61	523	1.090	3
1111-2	451	11.0	462	1.070	3
623	393	25	418	1.070	1
613-27	354	57	411	1.059	3
Merr 114	391	12	403	1.078	3
613-7	369	31	400	1.067	6
321-55*	354	45	389	1.106	2
613-9	339	48	387	1.067	4

*Derived from S. stoloniferum hybrids.

Several of the cultivars have been in overstate yield trials or seedling trials for three or more years and will be increased for commercial testing as soon as possible.

- MS 735-1 - A slightly elongated smooth white skinned seedling with shallow eyes and a very high yield potential. Primarily a table potato.
- MS 706-34 - A round white table potato with a consistently high yield potential; tends to be slightly rough especially the large tubers.
- MS 711-8 - A smooth oval shaped tuber that retains its shape; stores well for tablestock market.
- MS 706-1 - A round white with chip processing characteristics. Medium total solids but color is uniform and good; stores well.

Overstate Potato Variety Trials

The 1971 overstate potato variety trials were conducted at four locations: Shoemaker Bros. in Allegan County; Don Meyers in Bay County; Delekta Bros. in Presque Isle County; and the Montcalm Experimental Farm. Growing conditions in each location were quite variable and undoubtedly reflects the differences in variety performance between locations.

Table 5 summarizes the overall response when all of the data from the four locations are averaged. Table 6 provides the variety data at each of the locations. Table 5 does not include the specific gravity readings from the Presque Isle location. A look at the data from this location in Table 6 reveals specific gravity readings which appear to be abnormal. This location did receive considerable rainfall throughout the growing season which may have resulted in the lower-than-expected readings.

Two of the locations were irrigated - the Montcalm Experimental Farm and the Bay locations. The Allegan trial was on an organic soil. Planting and harvest dates for each locations are as follows: Bay County, April 28 and August 30; Allegan County, May 14 and October 1; Presque Isle, May 29 and October 11; and Montcalm Experimental Farm, April 27 and September 7. Plant spacings at all locations were 12 inches.

Michigan Table 5. The average yield, size distribution and specific gravity of several potato varieties grown at four locations, 1971.

Variety	Total Cwt/A	Size Distribution Percent			Specific Gravity
		-1-7/8	+3-1/4	1-7/8 -3-1/4	
Abnaki	447	5.3	27.3	67.4	1.076
Sioux	430	6.1	23.2	70.7	1.081
MS-709	396	5.5	33.5	61.0	1.074
Jewel	396	10.3	10.2	79.5	1.086
Onaway	388	5.6	27.2	67.2	1.071
Norchip	379	6.6	21.4	72.0	1.079
Shurchip	366	9.8	15.9	74.3	1.071
Cascade	364	5.3	13.5	81.2	1.073
Alamo	353	10.3	9.0	80.7	1.065
Wauseon	346	7.1	20.5	72.4	1.073
Iopride	335	10.0	12.7	77.3	1.069
MS 711-3	331	9.6	12.0	78.4	1.086
MS-58	329	8.3	15.5	76.2	1.081
MS-1111-2	297	7.0	24.9	68.1	1.064
Katahdin	294	9.0	18.5	72.5	1.073
York	288	5.4	22.1	72.5	1.071
MS-503	286	15.7	5.6	78.7	1.073
Average	354.4				

Michigan Table 6. The yield, size distribution and specific gravity of several potato varieties grown at four locations, 1971.

Variety	ALLEGAN CO.					BAY CO.				
	Total Cwt/A	Percent		Sp. Gr.	Variety	Total Cwt/A	Percent		Sp.	Gr.
		-1-7/8	+3-1/4				-1-7/8	+3-1/4		
Abnaki	488	4.4	38.0	1.077	Abnaki	488	5.8	36.7	1.078	1.078
Jewel	454	13.7	2.0	1.084	Jewel	473	14.1	8.3	1.091	1.091
Shurchip	395	9.4	16.3	1.071	Shurchip	387	17.3	8.1	1.073	1.073
Cascade	373	6.3	19.9	1.073	Cascade	433	5.4	10.8	1.077	1.077
Norchip	371	6.3	23.2	1.078	Norchip	435	10.0	15.4	1.081	1.081
Onaway	367	8.5	31.4	1.069	Onaway	394	4.0	30.8	1.075	1.075
Sioux	351	6.7	21.1	1.076	Sioux	493	5.7	34.2	1.084	1.084
Iopride	334	8.2	15.8	1.068	Iopride	363	10.7	16.3	1.069	1.069
Wauseon	326	8.3	22.2	1.073	Haig	496	7.8	10.4	1.075	1.075
Alamo	303	14.2	4.5	1.066	MS-709	466	7.7	29.4	1.073	1.073
MS-709	314	8.1	33.5	1.072	Katahdin	376	9.5	18.7	1.071	1.071
York	306	6.4	26.1	1.071	MS 711-3	332	16.4	6.1	1.081	1.081
MS 1111-2	293	5.4	33.3	1.065	MS 1111-2	329	14.2	6.2	1.063	1.063
MS 711-3	275	7.8	2.1	1.086	MS-503	301	31.1	0	1.070	1.070
Katahdin	264	6.0	20.7	1.074						
MS-503	243	12.0	2.4	1.078						

Michigan Table 6. (Continued)

Montcalm Experimental Farm

Presque Isle County

Variety	Total Cwt/A	Percent			Sp. Gr.	Variety	Total Cwt/A	Percent			Sp. Gr.
		- 1-7/8	+3-1/4	1-7/8-3-1/4				-1-7/8	+3-1/4	1-7/8-3-1/4	
Onaway	437	2.7	13.8	83.5	1.070	Sioux	454	6.4	20.2	73.4	1.066
Sioux	423	5.5	17.4	77.1	1.081	Alamo	402	6.3	13.6	80.1	1.056
MS-709	407	4.3	31.1	64.6	1.075	MS-709	395	2.0	40.1	57.9	1.064
Abnaki	379	5.1	11.9	83.0	1.073	MS 711-3	387	4.5	38.2	57.3	1.068
Iopride	373	5.7	8.4	85.9	1.070	Norchip	381	3.0	38.5	58.5	1.070
Jewel	351	6.7	7.2	86.1	1.083	Shurchip	374	3.6	29.7	66.7	1.062
Cascade	345	4.0	9.6	86.4	1.070	Wauseon	365	5.9	18.7	75.4	1.065
MS-711-3	328	9.5	1.8	88.7	1.089	Abnaki	363	5.9	22.6	71.5	1.066
Norchip	328	7.2	8.3	84.5	1.078	Onaway	353	7.2	32.6	60.2	1.060
MS-58	324	10.2	0	89.8	1.081	MS-503	351	5.0	12.2	82.8	1.065
Shurchip	306	8.9	9.6	81.5	1.067	MS-58	334	6.4	31.0	62.6	1.058
Katahdin	285	10.3	20.5	69.2	1.075	Cascade	304	5.7	13.5	80.8	1.063
MS 1111-2	275	5.7	17.0	77.3	1.065	Jewel	303	6.5	23.2	70.3	1.067
MS-503	248	15.0	7.8	77.2	1.072	MS 1111-2	289	2.7	43.2	54.1	1.062
						York	270	4.4	18.1	77.5	1.069
						Iopride	270	15.3	10.1	74.6	1.063
						Katahdin	250	10.1	14.1	75.8	1.067

Following are the general observations of each of the varieties:

- Abnaki - released in 1970, by the U. S. D. A., New York and Maine. In all locations the yields and size distribution and general appearance were exceptionally good. Tubers over 3-1/4 inch were common, however, they were not rough nor off-type. A closer spacing would help correct this factor. Specific gravity is medium; maturity is late; the tubers are round and somewhat flattened; and the skin was noted to be slightly netted at some locations. Abnaki is reported to be resistant to Verticillium wilt, mild mosaic and leafroll. No hollow heart was observed.
- Sioux - released in 1969, by Nebraska. This was the only red skin variety in the trials. The tubers have a slightly scaly russeted skin; are round and slightly flattened; and a fairly shallow eye. The yields, size distribution and general appearance were very good. Dry matter content was high. Maturity is similar to Kennebec. Sioux is reported to be resistant to scab, but is susceptible to Fusarium and Verticillium wilt and late blight.
- MS-709 - a Michigan seedling which will be released in 1972. Maturity is early (similar to Onaway) and medium dry matter. It has a smooth white skin, shallow eyes, and very acceptable appearance. At the 12-inch spacing used in these trials, the percent over 3-1/4 inches was considerable; however, a closer spacing would correct this concern. These oversize tubers did not go off-type, and hollow heart was not observed to be a concern. It does produce an acceptable chip out of the field; however, it is not suggested for chipping out of storage.
- Jewel - released by private breeders in New York in 1968. This variety has a very high dry matter content. Jewel is reported to have no disease resistance. Despite this it has continued to perform well in our trials. The tubers are white skinned; round and flattened; and shallow eyed. Maturity is similar to Kennebec.
- Onaway - used as a standard early maturing variety. Tubers were more off-type and irregular than in other years.
- Norchip - tuber shape and appearance this year were not as uniform and attractive as in other years. Some irregular shapes and off-types. Yields were favorable and dry matter content was medium-high.

- Shurchip - released in 1969, by Nebraska. This variety does have a high yield potential. The tubers do have a scaly russet on the skin. The tubers are elongated and somewhat flattened in appearance. Specific gravity was medium to medium low. Shurchip is reported to be resistant to scab and tolerant to Fusarium and Verticillium wilts. The foliage is susceptible; and the tubers are highly susceptible to late blight.
- Cascade - released in 1969, by the U. S. D. A. and Washington. This variety yielded about average with a medium specific gravity. It is a round white variety with a slightly netted skin and a favorable general appearance. The variety is reported to have moderate resistance to Verticillium wilt and the leafroll virus. Maturity was about medium.
- Alamo - released in 1967, by the U. S. D. A. and Texas. The tubers are somewhat elongated, have a smooth white skin and a medium eye depth. It appeared in this year's trials to set heavy and this is reflected in the size distribution. Its maturity is medium early and has resistance to late blight, common scab, net necrosis and mild mosaic.
- Wauseon - released in 1967, by the U. S. D. A. and New York. The tubers have a smooth white skin with a very slight netting on some soils. It has a round and somewhat flattened shape. It is a late maturing variety and has resistance to golden nematode and moderate resistance to common scab, latent and mild mosaics and net necrosis from current season leafroll infections.
- Iopride - was released in 1970, by Iowa. Maturity is medium early and the tubers were slightly netted in most locations. This variety performed about average in these trials and was medium to low in specific gravity.
- MS-711-3 - an unreleased Michigan seedling. The tubers are rounded with a very slight net showing at some locations. Tubers lacked uniformity in type and shape. Maturity is similar to Kennebec and it was one of the highest in specific gravity readings. It has a high dry matter and is a good processor.
- MS-58 - an unreleased inbred Merrimack from the Michigan program. It is a late maturing seedling which does have a high dry matter content. It has a good balance of protein for human nutrition as it is high in methionine - one of the amino acids commonly deficient in potatoes.
- MS-1111-2 - an unreleased Michigan seedling which has an early maturity.

Katahdin - included as a standard late maturing variety. In all locations this variety yielded well below average which is not typical of its usual performance. It is suspected that there must have been some loss in seed quality although its physical appearance did not indicate any concerns.

York - released in 1969 by Canada. The tubers had considerable netting at most locations, were round and slightly flattened and had a rather shallow eye depth. This variety was included at only the Allegan and Presque Isle locations and performed well below average at both locations. In the release description it is classed as early maturing and high total solids. Gravity readings at these two locations would rank it as medium to low. In Canadian trials it has performed best on the organic soils.

MS-503 - an unreleased Michigan seedling.

MINNESOTA

O. C. Turnquist, F. I. Lauer, E. B. Radcliffe

Good progress is being made in transferring capability of chipping directly from 40° F. storage from an unadapted clone, a cross of S. phureja with a haploid of Katahdin.

The character seems to be transmitted readily. In crosses of diploid 40° F chipping parents 15 and 69 percent of the seedlings gave light to intermediate colored chips in 1969 and 1970, respectively, suggesting a significant year's effect. Individual progenies ranged from 0-100 percent in 40° F chippers.

There appears to be a marked maternal effect. In the initial outcrosses with diploid non-40° F chippers, 9 percent of the offspring chipped satisfactorily when the source clone was used as a female. When used as a male, only 3 percent chipped. In subsequent outcrosses with cultivated tetraploid parents, 51 percent of the offspring chipped when the diploid 40° F chippers were used as females. When used as males, only 3 percent chipped.

A limited number of 40° F chippers have been analyzed chemically. The non-reducing sugar, sucrose, is about twice as high while the reducing sugars, fructose and glucose, are about 1/3 that of Kennebec and Norchip, two cultivars used extensively for chipping. Dr. Sinden, Beltsville, has also analyzed some of them for glycoalkaloid levels. Only 1 was observed that could be considered a "high" alkaloid potato.

We have progenies from tetraploid 40° F. chippers ready for evaluation this winter. These involve 3 types of crosses: 1) 40° F chippers x 40° F chippers; 2) 40° F chippers x non-40° F chippers; and 3) non-40° F chippers x 40° F chippers. The non-40° F. chippers are adapted stocks. Our plans for next year depend on the performance of the 3 types of crosses, currently under test. We have sufficient seed on hand to proceed on any of the 3 types of crosses.

Potato variety demonstrations were conducted at twelve locations in 1971. In the Red River Valley, plots were located at Baker, Crookston, Grand Forks and Argyle. Plots were also grown on the lighter soils at Fosston and at the North Central Experiment Station at Grand Rapids. In the irrigated area in central Minnesota, plots were grown at Staples, Broton, Big Lake, Elk River and Osseo. In southern Minnesota another plot was located on the organic soil at Hollandale. These trials are conducted in cooperation with commercial growers, county agricultural agents, branch experiment stations, Red River Valley Potato Growers Association and the Minnesota Department of Agriculture. The purpose of the demonstrations is to familiarize the grower with new varieties and to assist him in evaluating the varieties for use in his area.

All seed for the plots was produced the previous year under strict quarantine control at the isolated University of Minnesota potato seed increase farm at Embarrass, Minnesota. The potato increase and testing program is made possible through the financial assistance of the Minnesota Department of Agriculture Seed Potato Division.

At Elk River and Baker 50 varieties were tested, but at Crookston the number was increased to 60 to include the North Central Regional Potato Trial. At the Red River Valley Potato Research Farm, at Grand Forks, North Dakota, 26 varieties were grown, but at all other locations only 20 varieties were included. All plots consisted of twenty-hill rows and replicated twice.

At harvest time the potatoes from the entire plot were weighed and graded for size with a 2-inch screen. Samples were taken for specific gravity and chipping. The performance of the varieties and selections at the individual locations is reported in Tables 2, 3, 4 and 5. A summary of the results of the four locations in the Red River Valley is presented in Table 1. A summary of varietal performance on non-irrigated soils at 2 locations is presented in Table 6 and on irrigated sandy soils at 4 locations in Table 7. Samples from the Crookston and Grand Forks plots will be evaluated for chipping after storage at 40° F and after a six-week reconditioning period.

From 1965-70 nearly 1000 wild Solanum introductions (obtained by the Inter-Regional Potato Introduction Station, Sturgeon Bay, Wisconsin) have been field evaluated for resistance to green peach aphid, Myzus persicae, and potato aphid, Macrosiphium euphorbiae. We have not previously investigated the nature of this resistance. Therefore, a series of experiments were undertaken to investigate survival, development, and fecundity of the green peach aphid when reared on excised leaves of various Solanum introductions, hybrids, and representative cultivars. The potato aphid was tested on the cultivars. The introductions selected were all previously evaluated in Minnesota field trials and most had evidenced appreciable resistance.

Results of the excised leaf trials are presented in Tables 8-11. In each instance the entries are ranked according to the mean of the individual rankings for each of the criteria considered. The data in Table 8 was obtained in experiments using plants grown in a controlled environmental chamber (16 hrs. light at 21° C., 8 hrs. dark at 16° C.). The data in Tables 9-11 were obtained using field-grown plants. The laboratory trials were conducted at room temperature (21-27° C.) using the same 16:8 hr. light regime. Development time (first instar to maturity) was found to be identical regardless of which host the insects were reared on. However, at maturity the aphids reared on resistant plants were smaller (in one instance 1/10 normal size) and mortality was higher. Fecundity was markedly affected. The correlation between survival and fecundity was of low order. Similar results were obtained using either laboratory or field-grown plants. Differences between the wild introductions were much greater than between the cultivars.

The tests suggest resistance is due to antibiosis, perhaps the result of nutritional inadequacies. The results closely correlated with the results obtained by field procedures but the laboratory procedure appears more sensitive. As a method of assaying for aphid resistance in potato, the excised leaf technique was judged both practical and accurate.

Minnesota Table 1. Potato Variety Performance for Four Locations in the Red River Valley, 1971

Variety	Total Yield Per Acre cwt	U.S. No. 1 Size %	Specific Gravity	Dry Matter %
MD 7196-18 ^{2/}	364	83	1.090	21.8
FL-2 ^{3/}	312	95	1.089	21.6
Red Pontiac	301	96	1.079	19.4
Worchip	297	92	1.093	22.5
Kennebec	295	96	1.087	21.1
Grand Falls ^{3/}	294	96	1.080	19.7
Cascade	290	92	1.084	20.4
Whestain	290	93	1.082	20.1
Minn 3866	280	89	1.089	21.5
Minn 4536 ^{1/}	278	97	1.077	18.9
Minn 3935 ^{1/}	275	92	1.080	19.7
Minn 4537 ^{1/}	275	98	1.082	20.0
PA 6HS9 ^{1/}	273	98	1.086	20.9
Minn 4979 ^{4/}	272	94	1.071	17.7
Worchief	265	88	1.088	21.3
Minn 5134 ^{1/}	264	91	1.083	20.2
" 197-9 ^{2/}	262	83	1.094	22.7
Minn 5036 ^{1/}	262	92	1.084	20.4
Monona	261	90	1.090	21.8
Minn 4442 ^{1/}	261	95	1.096	23.1
Minn 3915 ^{1/}	260	92	1.088	21.3
Bake King	253	95	1.098	20.9
Irish Cobbler	251	94	1.085	20.8

Minnesota Table 1. Continued

Variety	Total Yield Per Acre	U.S. No. 1 Size	Specific Gravity	Dry Matter
	cwt	%		%
Nebr 1.57-1 <u>2/</u>	251	83	1.087	21.2
Minn 5200 <u>1/</u>	251	95	1.081	19.8
Norgold	248	89	1.087	21.1
Minn 5233 <u>1/</u>	247	91	1.091	22.0
Wis 634 <u>2/</u>	247	96	1.098	23.5
Bounty <u>4/</u>	246	89	1.090	21.8
Minn 5080 <u>1/</u>	246	93	1.083	20.2
Minn 4086	245	91	1.089	21.6
Wauseon	245	94	1.088	21.4
Minn 5211 <u>1/</u>	244	96	1.097	23.3
Nebr 93.55-16 <u>2/</u>	244	86	1.098	23.5
Minn 5209 <u>1/</u>	242	93	1.085	20.7
Raritan <u>3/</u>	237	96	1.096	23.1
Minn 4929 <u>1/</u>	235	91	1.074	18.3
Sioux <u>1/</u>	235	97	1.086	20.9
Norland	235	94	1.080	19.7
B6116-18 <u>2/</u>	234	76	1.091	22.0
LA 22-111 <u>2/</u>	229	94	1.085	20.7
Minn 5292 <u>1/</u>	227	93	1.086	20.9
Jewel	227	93	1.095	22.8
Peconic <u>1/</u>	225	89	1.098	23.5
Minn 4729 <u>1/</u>	223	97	1.089	21.6

Minnesota Table 1. Continued

Variety	Total Yield Per Acre	U.S. No. 1 Size	Specific Gravity	Dry Matter
	cwt	%		%
Nebr 49.62-5 ^{2/}	221	87	1.094	22.7
Russet Burbank ^{2/}	219	92	1.088	21.4
ND 6993-13	217	88	1.090	21.8
Minn 5072 ^{1/}	215	88	1.079	19.4
Minn 4928 ^{1/}	214	92	1.083	20.2
ND 6925-13	212	81	1.088	21.3
Minn 4833 ^{1/}	211	94	1.092	22.2
Minn 5394 ^{1/}	210	95	1.081	19.9
Superior ^{1/}	210	97	1.088	21.4
B6024-3 ^{2/}	209	84	1.079	19.4
Iopride ^{5/}	208	94	1.085	20.8
Anoka	207	94	1.089	22.3
Seminole ^{5/}	207	97	1.096	23.2
Shurchip ^{1/}	206	92	1.091	21.9
Wis 629 ^{2/}	204	84	1.092	22.2
ND 7003-2	201	78	1.074	18.3
Minn 5071 ^{1/}	197	88	1.083	20.3
Minn 4834 ^{1/}	188	92	1.092	22.2
Pembina Chip	182	85	1.086	20.9
Average	244	91	1.087	21.2

^{1/} Average at Baker and Crookston only.

^{2/} Average at Crookston only.

^{3/} Average at Grand Forks only.

^{4/} Average at Baker only.

^{5/} Average at Baker, Crookston, and Grand Forks only.

Minnesota Table 2. Potato Variety Adaptation Trial, Baker, Minnesota, 1971

Variety	Total Yield Per Acre cwt	U.S. No. 1 Size %	Specific Gravity	Dry Matter %
Norchief	292	93	1.091	22.0
Minn 3866	288	89	1.090	21.8
Minn 4929	277	88	1.072	18.0
Cascade	273	89	1.082	20.1
Minn 3935	272	89	1.082	20.1
Minn 4979	272	94	1.071	17.7
Minn 4537	271	98	1.083	20.3
Minn 5072	267	86	1.082	20.1
Minn 5080	267	91	1.086	20.9
Minn 5211	267	96	1.102	24.4
Minn 5209	265	93	1.086	20.9
Chieftain	262	96	1.089	21.6
Minn 4536	259	97	1.081	19.9
PA 6HS9	256	97	1.081	19.9
Minn 5200	255	95	1.085	20.7
Norchip	255	96	1.097	23.3
Peconic	255	91	1.100	24.0
Minn 5071	254	92	1.088	21.4
Wauseon	250	95	1.097	23.3
Kennebec	249	96	1.087	21.2
Monona	249	84	1.094	22.7
Minn 4086	247	93	1.096	23.1
Bounty	246	89	1.090	21.8
Red Pontiac	245	97	1.087	21.2
Irish Cobbler	243	96	1.088	21.4
Minn 5036	241	92	1.084	20.5
Minn 5234	240	91	1.081	19.9
Sioux	239	96	1.087	21.2
Minn 3915	237	91	1.096	23.1
ND 6925-13	236	80	1.086	20.9
Minn 4729	234	96	1.091	22.0
Jewel	231	93	1.091	22.0
Minn 4442	226	94	1.096	23.1
Norgold	226	88	1.087	21.2
Seminole	224	97	1.096	23.1
Shurchip	223	95	1.093	22.4
Minn 5233	223	93	1.089	21.6
Minn 5394	215	96	1.079	19.4
Minn 5292	214	92	1.086	20.9
Bake King	214	95	1.102	24.4
ND 6993-13	209	87	1.096	23.1

Minnesota Table 2. Continued

Variety	Total Yield Per Acre	U.S. No. 1 Size	Specific Gravity	Dry Matter
	cwt	%		%
Anoka	206	94	1.093	22.4
Norland	205	97	1.085	20.7
Iopride	201	87	1.091	22.0
Superior	198	97	1.089	21.6
ND 7003-2	194	79	1.075	18.6
Minn 4833	191	95	1.092	22.2
Minn 4834	187	95	1.096	23.1
Minn 4928	187	96	1.083	20.3
Pembina Chip	170	84	1.088	21.4
Average	238	92	1.088	21.4

Cooperators: Grower: Frank Thompson & Sons, Baker Minnesota
County Agricultural Agent: Ozzie Daellenbach, Clay County,
Moorehead, Minnesota.

Planted: May 7, 1971

Harvested: September 14, 1971

Spacing: 12" Hills, 38" Rows

Fertilizer: 150 lbs. 12-36-12 broadcast.

200 lbs. 17-17-17 with planter.

Minnesota Table 3. Potato Variety Adaptation Trial, Crookston, Minnesota, 1971

Variety	Total Yield Per Acre cwt	U.S. No. 1 Size %	Specific Gravity	Dry Matter %
ND 7196-18	364	83	1.090	21.8
Kennebec	302	94	1.087	21.2
Irish Cobbler	301	96	1.088	21.4
Minn 4536	297	97	1.072	18.0
Minn 4442	295	95	1.096	23.1
Red Pontiac	293	97	1.078	19.2
PA 6HS9	290	98	1.090	21.8
Minn 5234	287	90	1.084	20.5
Minn 5036	283	91	1.083	20.3
Norchip	282	90	1.094	22.7
Minn 4537	278	98	1.080	19.7
Minn 3915	278	92	1.086	20.9
Minn 3935	277	95	1.078	19.2
Monona	273	95	1.086	20.9
Norgold	273	89	1.088	21.4
Minn 5233	270	88	1.093	22.4
Minn 4086	270	91	1.091	22.0
B6097-9	262	83	1.094	22.7
Minn 3866	256	90	1.092	22.2
Nebr 1.57-1	251	83	1.087	21.2
Minn 5200	247	95	1.076	18.8
Chieftain	247	91	1.082	20.1
Wis 634	247	96	1.098	23.5
Nebr 93.55-16	244	86	1.098	23.5
Minn 4928	240	87	1.082	20.1
Minn 5292	239	94	1.086	20.9
Norchief	237	92	1.086	20.9
Norland	237	93	1.077	19.0
B6116-18	234	76	1.091	22.0
ND 6925-13	232	74	1.088	21.4
Sioux	231	97	1.084	20.5
Wauseon	231	93	1.088	21.4
Minn 4833	230	92	1.092	22.2
La 22-111	229	94	1.085	20.7
Cascade	224	95	1.088	21.4
Minn 5080	224	95	1.079	19.4
Superior	221	97	1.087	21.2
Nebr 49.62-5	221	87	1.094	22.7
Jewel	220	91	1.099	23.7
Minn 5211	220	96	1.092	22.2
ND 7003-2	219	67	1.068	17.1
Fusset Burbank	219	92	1.088	21.4
Minn 5209	218	92	1.084	20.5
ND 6923-13	218	89	1.088	21.4
Bake King	213	95	1.106	14.5

Minnesota Table 3. Continued

Variety Variety	Total Yield Per Acre cwt	U.S. No. 1 Size %	Specific Gravity	Dry Matter %
Minn 4729	212	97	1.087	21.2
B6024-3	209	84	1.079	19.4
Minn 5394	204	93	1.083	20.3
Wis 629	204	84	1.092	22.2
Peconic	194	86	1.095	22.9
Minn 4929	193	93	1.075	18.6
Seminole	193	96	1.098	21.5
Anoka	192	97	1.088	21.4
Shurchip	188	89	1.086	21.4
Minn 4834	188	89	1.087	21.2
Pembina Chip	188	83	1.086	20.9
Iopride	184	97	1.084	20.5
Minn 5072	162	90	1.075	18.6
Minn 5071	140	84	1.078	19.2
Average	239	91	1.086	20.9

Cooperators: Grower: B. C. Beresford, Northwest Experiment Station, Crookston,
Minnesota

Planted: May 11, 1971

Harvested: September 8, 1971

Vines Killed: Rotobeat, September 4, 1971

Spacing: 12" Hills, 40" Rows

Fertilizer: 400 lbs. 5-20-20 with planter

Insecticides: Thimet, Cygon, Zolene

Fungicides: Polyram

Herbicides: Eptam, Sencor

Minnesota Table 4. Potato Variety Adaptation Trial, Elk River, Minnesota, 1971

Variety	Total Yield Per Acre cwt	U.S. No. 1 Size %	Specific Gravity	Dry Matter %
Minn 4834	587	93	1.074	18.4
Minn 4537	519	99	1.074	18.4
Minn 4729	496	96	1.075	18.6
Minn 4929	478	95	1.074	18.4
Minn 5072	464	95	1.073	18.2
Norchief	463	94	1.075	18.6
Red Pontiac	458	98	1.068	17.1
Kennebec	451	97	1.072	18.0
Chieftain	448	92	1.072	18.0
Minn 5071	446	93	1.072	18.0
Minn 5036	443	88	1.071	17.7
Minn 5233	432	94	1.071	17.7
Minn 4086	423	90	1.078	19.2
Minn 4979	418	97	1.066	16.7
Minn 3935	417	90	1.076	18.8
Norland	417	94	1.068	17.1
Norchip	416	89	1.081	19.9
PA 6HS9	413	95	1.069	17.3
Topride	405	97	1.075	18.6
Minn 3866	404	80	1.082	20.1
Superior	403	98	1.078	19.2
Anoka	401	93	1.073	18.2
Minn 4833	400	92	1.082	20.1
Sioux	398	88	1.063	16.0
Peconic	395	86	1.080	19.7
Minn 5211	394	98	1.083	20.3
ND 6925-13	387	88	1.072	18.0
Minn 4536	381	98	1.071	17.7
Norgold	375	92	1.068	17.1
Shurchip	372	91	1.073	18.2
Minn 5080	367	98	1.073	18.2
Wauseon	363	95	1.079	19.4
Minn 4928	356	90	1.072	18.0
Cascade	355	89	1.072	18.0
Minn 5234	354	88	1.067	16.9
Irish Cobbler	354	88	1.069	17.3
ND 6993-13	353	88	1.082	20.1

Minnesota Table 4. Continued

Variety	Total Yield Per Acre cwt	U.S. No. 1 Size %	Specific Gravity	Dry Matter %
Minn 3915	350	88	1.077	19.0
Monona	349	94	1.069	17.3
Seminole	334	99	1.060	15.4
Waseca	333	91	1.061	15.6
Minn 5209	326	89	1.076	18.8
Russet Burbank	326	86	1.082	20.1
Jewel	324	94	1.079	19.4
Minn 5394	314	96	1.065	16.5
Pembina Chip	313	85	1.077	19.0
Early Gem	305	97	1.063	16.0
ND 7003-2	304	93	1.060	15.4
Bake King	299	88	1.088	21.4
Minn 5292	294	95	1.065	16.5
Average	392	92	1.073	18.2

Cooperator: Glenn Titrud, Sand Plain Experiment Farm, Elk River, Minnesota

Planted: May 5, 1971

Harvested: August 19, 1971

Spacing: 12" Hills, 36" Rows

Fertilizer: 1100 lbs. per A 8-16-16 with planter.

183 lbs. per A 33-0-0 June 8 sidedressed.

200 lbs. per A 33-0-0 June 22 sidedressed.

Herbicide: Eptam $4\frac{1}{2}$ qts. per A preplant soil incorporated April 14.

Insecticide: Thimet 15 G., 15 lbs. per A at planting.

Vine Killer: Evik 80 W 4 lbs. per A August 5

Minnesota Table 5. Potato Variety Demonstration Planting, Hollandale, Minnesota, 1971

Variety	Total Yield Per Acre cwt	U.S. No. 1 Size %	Specific Gravity	Dry Matter %
Norchief	490	92	1.069	17.3
Chieftain	458	96	1.063	16.0
Norchip	439	92	1.075	18.6
Red Pontiac	438	97	1.058	15.0
ND 6993-13	411	94	1.067	16.9
Norgold	395	94	1.064	16.2
Irish Cobbler	389	92	1.066	16.7
Kennebec	379	96	1.062	15.8
Bake King	371	97	1.073	18.2
Cascade	367	95	1.061	15.6
Cherokee	366	98	1.068	17.1
Minn 3866	353	88	1.075	18.6
Wauseon	350	94	1.064	16.2
Minn 4086	350	93	1.067	16.9
Minn 3915	347	95	1.070	17.5
Anoka	337	93	1.072	18.0
Jewel	330	93	1.077	19.0
Norland	329	92	1.061	15.6
ND 7003-2	289	86	1.056	14.5
ND 6925-13	289	81	1.063	16.0
Average	374	93	1.067	16.8

Cooperators: Grower: C. Muilenburg & Sons
County Agricultural Agent: Eldon Senske, Freeborn County,
Albert Lea, Minnesota

Planted: May 25, 1971

Harvested: October 7, 1971

Spacing: 12" Hills, 34" Rows

Fertilizer: 1600 lbs. 0-14-42 Broadcast

Minnesota Table 6. Potato Varietal Performance at Two Locations on
Non-Irrigated Sandy Soils of Minnesota 1971

Variety	Total Yield Per Acre cwt	U.S. No. 1 Size %	Specific Gravity	Dry Matter %
Kennebec	370	97	1.083	20.2
Red Pontiac	354	94 <u>1/</u>	1.067	16.8
Bake King	332	91	1.088	21.3
Norchief	310	94	1.079	19.4
Wauseon	296	91	1.093	22.3
Minn 3866	292	89	1.080	19.7
ND 6993-13	283	84	1.083	20.3
Anoka	275	94	1.076	18.7
Irish Cobbler	275	91	1.079	19.4
Chieftain	273	92	1.067	16.9
Norchip	265	90	1.085	20.7
Minn 3915	263	92	1.077	19.0
Norgold	248	95	1.078	19.2
Minn 4086	236	92	1.073	18.1
ND 6925-13	235	90	1.078	19.2
Jewel	214	94	1.092	22.3
Norland	211	95	1.070	17.4
Russet Burbank	199	88	1.080	19.6
ND 7003-2	190	76	1.069	17.2
Pembina Chip	164	74	1.074	18.3

1/ One location only.

Minnesota Table 7. Potato Varietal Performance of Four Locations on
Irrigated Sandy Soils of Minnesota 1971

Variety	Total Yield Per Acre cwt	U.S. No. 1 Size %	Specific Gravity	Dry Matter %
Kennebec	429	95	1.076	18.8
Norchip	422	91	1.081	19.9
Norchief	420	90	1.076	18.8
Chieftain	419	94	1.073	18.1
Anoka	419	87	1.077	19.1
Norland	408	93	1.067	16.9
Bake King	394	93	1.095	22.8
Minn 4086	378	84	1.078	19.3
Red Pontiac	376	93	1.070	17.6
Norgold	371	94	1.078	19.2
Irish Cobbler	371	88	1.077	19.1
Jewel	358	91	1.086	21.0
Minn 3866	357	83	1.079	19.4
Superior <u>1/</u>	351	94	1.080	19.6
Wauseon	344	93	1.078	19.1
Russet Burbank <u>1/</u>	344	88	1.086	20.9
Minn 3915	342	88	1.078	19.3
ND 6993-13	341	88	1.079	19.4
ND 7003-2	307	80	1.066	16.6
ND 6925-13	299	74	1.074	18.4
Pembina Chip <u>1/</u>	284	84	1.082	19.8

1/ Two locations only.

Minnesota Table 8. Aphid resistance in tuber-bearing Solanum species. Survival and fecundity of green peach aphids reared on excised leaves.

Identification	Species or variety	No of aphids			Mean wt (mg) of surviving aphids		Mean no.	
		1st instar introduced	attained 3rd instar	became adults	at 3rd instar	as adults	progeny/survivor female	
PI 310964	<u>stoloniferum</u>	36	2	1	0.090	0.110	0	
PI 160226	<u>stoloniferum</u>	39	11	10	0.092	0.155	10	
PI 186559	<u>hjertingii</u>	39	10	8	0.110	0.130	33	
PI 201855	<u>stoloniferum</u>	19	6	3	0.123	0.145	3	
PI 243513	<u>bulbocastanum</u>	19	3	0	0.210	-	0	
PI 275200	<u>bulbocastanum</u>	10	9	7	0.289	0.325	26	
	<u>t. subsp. tuberosum</u> , <u>'Norland'</u>	10	10	10	0.500	0.831	92	

Minnesota Table 9. Aphid resistance in tuber-bearing *Solanum* species. Survival and duration of reproduction of green peach aphids reared from first instar on excised leaves of various entries.

Identification	Species, variety of hybrid	No. surviving to adult ^{a/}	Ave. duration of reproduction (days) ^{b/}	Total No. nymphs produced
PI 245939	<u>etuberosum</u>	7 a	6.4 a	66
PI 275271	<u>multidissectum</u>	15 b-d	7.6 ab	249
PI 205560.1	<u>capsicibaccatum</u>	16 b-e	8.4 a-c	146
PI 195188	<u>stenotonum</u>	15 b-d	11.2 a-e	591
PI 320265	<u>brachistotrichum</u>	17 b-f	9.2 a-d	228
PI 255520.1	<u>cardiophyllum</u>	21 c-g	11.6 a-f	544
PI 275146	<u>infundibuliforme</u>	19 c-g	13.6 c-f	364
PI 310945	<u>marinasense</u>	20 b-g	14.0 c-f	741
PI 210052	<u>multidissectum</u>	23 c-g	9.2 a-d	642
Mn 1843.70	<u>stoloniferum</u> x <u>t. subsp. tuberosum</u>	23 e-g	10.2 a-d	326
Mn 1850.70	<u>multidissectum</u> x <u>phureja-2N derivatives</u>	22 f-g	12.2 b-f	530
PI 275248	<u>stoloniferum</u>	16 d-f	12.0 a-f	316
WRF 1144	<u>andreaeanum</u>	22 b-c	17.2 f-h	724
Mn 1850.70	<u>multidissectum</u> x <u>phureja-2N derivatives</u>	20 d-g	10.0 a-d	492
Mn 1817.69.1-70	<u>phureja</u> x <u>2N tuberosum</u>	21 c-g	14.8 d-g	781
PI 365356	unidentified	23 d-g	13.8 c-f	764
PI 265863	<u>canasense</u>	21 e-g	11.4 a-f	290
PI 195167	<u>stoloniferum</u>	20 c-g	14.8 d-g	531
Mn 1823.69-4-70	<u>phureja</u> x <u>2N tuberosum</u>	22 d-g	15.0 d-g	1000
PI 233125.1	<u>megistacrolobum</u>	24 d-g	14.4 d-g	564
PI 275246	<u>stoloniferum</u>	24 fg	12.4 b-f	385
WRF 1861	<u>t. subsp. andigena</u> x <u>maglia</u>	22 e-g	14.6 d-g	781
PI 210038.1	<u>gourlayi</u>	22 e-g	14.2 e-f	929
PI 208876	<u>spgazzinii</u>	23 d-g	19.8 gh	1090
PI 237208	<u>t. subsp. andigena</u>	25 g	16.8 e-h	1130
PI 310993	<u>lignicaule</u>	25 g	20.4 h	1093

^{a/} Twenty-five nymphs, 5/excised leaf introduced to all entries except S. marinasense which had 27 and S. stoloniferum, PI 275248, which had 26. Data were analyzed using percentage transformation.

^{b/} Means flanked by the same letter not significantly at 5% level.

Minnesota Table 10. Aphid resistance in tuber-bearing Solanum species. Fecundity of green peach aphid reared on excised leaves of various entries.

Identification	Species, variety or hybrid	Cumulative mean no. progeny/ female <u>a/</u> at indicated intervals			end of <u>b/</u> reproductive period
		day 6	day 12	day 12	
PI 245939	<u>etuberosum</u>	4.8 a	6.5 a	7.4 a	
PI 205560.1	<u>capsicibaccatum</u>	8.8 ab	17.9 b	17.9 ab	
PI 320265	<u>brachistotrichum</u>	11.5 bc	17.9 b	17.9 ab	
PI 265863	<u>canasense</u>	13.3 b-d	19.8 b	21.4 ab	
PI 275271	<u>multidissectum</u>	15.7 c-e	25.9 bc	26.6 bc	
PI 275246	<u>stoloniferum</u>	17.3 c-f	27.9 b-d	29.5 b-d	
Mn 1843.70	<u>stoloniferum</u> x <u>t. subsp. tuberosum</u>	23.8 f-i	30.3 b-d	30.4 b-d	
PI 275248	<u>stoloniferum</u>	14.0 b-d	27.7 c-e	31.7 b-d	
PI 255520.1	<u>cardiophyllum</u>	19.4 d-h	37.9 d-f	40.2 c-e	
PI 275146	<u>infundibuliforme</u>	19.5 d-h	37.3 d-f	40.3 c-e	
WRF 1861	<u>t. subsp. andigena</u> x <u>maglia</u>	20.8 e-h	37.1 d-f	40.7 c-e	
PI 233125.1	<u>megistacrolobum</u>	25.5 hi	37.9 d-f	42.6 c-e	
Mn 1850.70	<u>multidissectum</u> x <u>phureja-2N derivatives</u>	29.0 ij	42.6 d-f	43.7 de	
Mn 1850.70	<u>multidissectum</u> x <u>phureja-2N derivatives</u>	24.1 g-i	37.9 d-f	45.8 d-f	
PI 210052	<u>multidissectum</u>	28.6 ij	43.3 ef	45.9 d-f	
PI 195188	<u>stenotonum</u>	30.0 ij	46.5 fg	48.6 e-g	
PI 195167	<u>stoloniferum</u>	18.6 d-g	37.7 fg	49.1 e-g	
PI 365356	<u>unidentified</u>	24.9 g-i	44.0 fg	49.2 e-g	
PI 310945	<u>marinasense</u>	23.6 f-i	46.2 f-h	50.9 e-g	
WRF 1144	<u>andreaeanum</u>	21.0 e-h	39.4 f-h	53.6 e-g	
Mn 1817.69-1-70	<u>phureja</u> x <u>2N tuberosum</u>	24.5 g-i	45.1 f-h	53.9 e-g	
Mn 1823.69-4-70	<u>phureja</u> x <u>2N tuberosum</u>	33.6 j-k	54.9 f-h	61.1 f-h	
PI 210038.1	<u>gourlayi</u>	34.1 j-k	55.8 gh	62.2 f-h	
PI 237208	<u>t. subsp. andigena</u>	37.6 k	55.9 h	64.1 gh	
PI 310993	<u>lignicaule</u>	21.8 e-h	46.0 h	79.2 h	
PI 203876	<u>spagazzinii</u>	21.8 e-h	46.0 h	79.2 h	

a/ Mean no. of progeny/female obtained from green peach aphids surviving to maturity on excised leaves of various Solanum entries (table 9).

b/ Mean flanked by the same letter are not significantly different at 5% level.

Minnesota Table 11. Aphid resistance in *Solanum tuberosum* subsp. *tuberosum* cultivars. Survival and duration of reproduction of green peach aphids and potato aphids reared from first instar on excised leaves.^{a/}

Variety	Green peach aphid ^{b/}			Potato aphid ^{b/}		
	No. surviving to adult	Ave. duration reproduction (days)	Total No. nymphs produced	No. surviving to adult	Ave. duration reproduction (days)	Total No. nymphs produced
Katahdin	13 a	11.8 a	543	25 b	15.8 ab	1049
Wauseon	23 bc	17.4 b-d	1208	24 b	19.2 bc	1039
White Rose	18 ab	16.8 bc	1127	23 ab	17.4 a-c	1099
Russet Burbank	21 bc	18.9 cd	1184	23 b	16.6 a-c	1112
Grand Falls	25 c	16.2 b	1522	22 ab	16.4 a-c	740
Green Mountain	21 bc	16.8 bc	1211	22 ab	17.4 a-c	1219
Anoka	20 a-c	16.8 bc	1161	25 b	18.2 a-c	1286
Norland	21 a-c	15.8 b	1386	19 a	15.0 a	740
High Plains	24 bc	17.4 b-d	1635	21 ab	16.2 a-c	1277
Irish Cobbler	23 bc	17.6 b-d	1779	24 b	16.8 a-c	1606
Norchip	23 bc	19.8 d	1929	22 ab	19.6 c	1216

^{a/} Twenty-five nymphs, 5/excised leaf introduced in all cultivars.

^{b/} Data were analyzed using percentage transformation. Means flanked by the same letter not significantly at 5% level.

MISSISSIPPI

William L. Hawthorne

1971 Irish Potato Replicated and Observational Trials

Replicated and observational trials were grown at the Delta Branch Experiment Station in 1971. These trials were planted on March 11, 1971, and harvested on June 21 & 22, 1971; involving a 103-day growing season. A plot consisted of one row 40 inches wide and 25 feet long with plants spaced one foot in the row. Plots were fertilized at the rate of 300 pounds per acre of 10-20-20 analysis fertilizer 10 days prior to planting. On March 11, 1971, at planting, 30 pounds per acre of a 10 percent active granular formulation of Thimet was applied for insect control. Enide was applied on March 11, 1971, at the rate of five pounds per acre for weed control. The final cultivation to control weeds and layby to prevent "tuber greening" was made on April 29, 1971. During the growing season the plots received 14.48 inches of rainfall. Supplemental furrow irrigation was added as needed to maintain maximum plant and tuber development.

Random samples from the replicated trials were rated for chip color, after-boiling darkening, refractameter reading on the raw potato percent soluble solids, percent solids of the raw tubers, and shear press readings of the canned potatoes. Chip color ratings taken July 1, 1971, were based on an average of five ratings using The Potato Chip Institute Color Chart, with ratings from one to 10. The after-boiling ratings taken June 28, 1971, were based on an average of five ratings using one to denote no darkening and five to denote the darkest.

Replicated Trials. The replicated trials included 33 entries which are listed in Table I. The yields ranged from 178 to 350 cwt. per acre with specific gravities ranging from 1.051 to 1.079. The variety Lenape, which has been withdrawn by the U.S.D.A., due to its tendency to accumulate high amounts of glycoalkaloids, possessed the highest specific gravity reading and produced light colored chips. The breeding line, B5960-5 or BR5960-5, produced high yields at Stoneville for the second consecutive year, 318 cwt. per acre. This Campbell Soup Company and U.S.D.A. line had a specific gravity of 1.064 and a chip color rating of 4.0. One other outstanding quality of the line, B5960-5, was its high percent of No. 1 tubers, 90.2 percent. Clones possessing specific gravity readings of 1.070 or higher were: B6603-12, Lenapa, Norchip, Seminole, B6562-14 and BR6851-2. These clones would all be considered excellent for chipping. The after-boiling ratings are also included in Table III. In general the majority of the entries had acceptable boiling ratings. The exceptions were those with ratings of 3.0 and higher. Tables IV through VI present the refractament reading on the raw potato percent soluble solids, percent solids of the raw potato, and shear press and hunter color readings on the canned potatoes.

Observational Trials. The observational trials included 45 entries from the U. S. Department of Agriculture breeding program, which are listed in Table VII. The yields ranged from 111 to 326 cwt. per acre with specific gravities ranging from 1.046 to 1.074. The red skinned clone, B6751-3, produced the highest yield of No. 1 tubers per acre with a specific gravity

of 1.060. Among the white skinned clones tested, the B6097-9 breeding line produced the highest yield, 316 cwt. per acre. Thirteen clones from the observational trials were selected for further studies in 1972.

Table I
1971 Replicated Irish Potato Varietal Trials ^{1/}
Delta Branch Experiment Station

Entry	Total Yield (Cwt.)	% No. 1's	Specific Gravity	Overall Ratings <u>2/</u>	Chip Color Ratings <u>3/</u>	After Boiling Ratings <u>4/</u> (Darkening)
BR 6820-26	350	83.3	1.062	3.0	6.9	1.9
BR 5960-5	318	90.2	1.064	3.5	4.0	2.8
Alamo (USDA)	318	92.7	1.055	3.5	5.0	2.0
Alamo - 3041	309	89.6	1.058	3.5	5.1	2.1
BR 6456-1	303	93.1	1.066	3.5	4.3	1.4
B 6603-12 (USDA)	302	84.9	1.078	3.5	2.9	1.7
Lenapa (USDA)	297	84.3	1.079	3.0	3.5	3.5
BR 5970-4	293	83.4	1.063	3.5	5.6	2.1
BR 6463-2	291	82.4	1.069	3.0	3.0	2.1
LaChipper	290	87.8	1.066	3.5	3.0	2.1
BR 6306-22	286	94.2	1.062	3.0	3.5	1.1
Norchip	280	91.4	1.071	2.5	2.8	1.9
Superior (USDA)	280	93.2	1.066	3.5	3.5	2.0
BR 6316-5	277	89.9	1.069	4.0	3.9	2.4
BR 6317-21	277	91.6	1.061	2.5	4.9	2.3
BR 6448-7	276	89.7	1.059	4.0	3.7	2.5
BR 6446-2	272	90.3	1.058	2.5	5.8	2.5
BR 6820-29	266	89.2	1.065	3.5	3.6	2.2
BR 6316-7	261	82.9	1.069	3.5	5.0	3.0
BR 6824-1	259	84.9	1.064	3.0	3.1	2.7
Katahdin - 3089	255	87.8	1.058	3.0	4.4	2.2
Kennebec - 3090	255	87.1	1.056	3.0	4.6	1.9
BR 6626-5	254	78.9	1.064	3.5	5.0	3.9
BR 6617-2	252	92.9	1.051	4.0	8.4	2.2
Seminole	252	91.9	1.077	3.5	3.2	3.3
B 6562-14 (USDA)	252	82.3	1.071	3.0	3.1	2.0

Continued

Table I
Continued

1971 Replicated Irish Potato Varietal Trials

Entry	Total Yield (Cwt.)	% No. 1's	Specific Gravity	Overall Ratings <u>2</u> /	Chip Color Ratings <u>3</u> /	After Boiling Ratings <u>4</u> / (Darkening)
BR 6851-2	237	92.2	1.071	3.5	4.3	2.1
Kennebec	225	84.5	1.054	2.5	4.1	2.5
B 6558-16 (USDA)	220	81.6	1.067	3.0	3.0	2.3
BR 6491-5	219	75.0	1.069	3.5	3.6	2.7
BR 6862-2	214	93.5	1.064	3.5	4.0	1.4
B 6599-1 (USDA)	211	78.6	1.051	3.0	4.1	2.1
L 22-111 (LSU)	178	86.9	1.051	3.5	5.0	2.2
L.S.D	.05	4.6	.002			
	.01	6.0	.003			
C.V.	12.5	3.7	.133			

1/ Planted: March 11, 1971; Harvested: June 21 & 22, 1971.

Graded: June 21 & 22, 1971.

Fertilizer: 10-20-20 at 300 lbs./A.

Herbicide: Enide (3-11-71) 5 lbs./A.

Insecticide: Thimet (3-11-71) at 30 lbs./A. and Sevin.

Fungicide: Maneb.

Plots: 25' x 3.3'.

Data based on 4 replications

2/ Overall Rating: based on yield, appearance at harvest, rotting, second growth, heat sprouts, cracking, etc. 1 = poor; 5 = excellent.

3/ Ratings based on the International Potato Chip Institute Color Reference Standard. Each rating is the average of a five member panel based on replications 1 and 2 from the trials.

4/ 1 = no darkening; 5 = severe darkening. Each visual rating is the average of a five member panel based on replications 1 and 2 from the trials.

Table II
1971 Replicated Irish Potato Trials
Delta Branch Experiment Station
Stoneville, Mississippi

Chip Color Ratings^{1/}
July 1, 1971

	Rep. 1	Rep. 2	Mean
BR 6463-2	2.8	3.2	3.0
BR 6617-2	9.2	7.6	8.4
BR 6626-5	6.0	4.0	5.0
BR 6862-2	5.0	3.0	4.0
BR 6491-5	4.2	3.0	3.6
Alamo - 3041	4.6	5.6	5.1
Katahdin - 3089	4.2	4.6	4.4
Kennebec - 3090	4.4	4.8	4.6
Norchip	2.8	2.8	2.8
BR 6820-26	5.8	8.0	6.9
BR 6820-29	3.6	3.6	3.6
BR 6824-1	2.8	3.4	3.1
BR 6851-2	5.4	3.2	4.3
BR 5960-5	4.8	3.2	4.0
BR 5970-4	6.8	4.4	5.6
BR 6306-22	3.6	3.4	3.5
Br 6316-5	3.8	4.0	3.9
BR 6316-7	4.4	5.6	5.0
Seminole	3.4	3.0	3.2
BR 6317-21	3.6	6.2	4.9
BR 6446-2	5.6	6.0	5.8
BR 6448-7	3.2	4.2	3.7
BR 6456-1	4.6	4.0	4.3
B 6558-16	3.0	3.0	3.0
B 6562-14	3.4	2.8	3.1
B 6599-1	3.6	4.6	4.1
B 6603-12	3.0	2.8	2.9
Kennebec	3.2	5.0	4.1
Lenape(B 5141-6)	3.2	3.8	3.5
LaChipper	3.2	2.8	3.0
Alamo	4.8	5.2	5.0
Superior	4.2	2.8	3.5
L 22-111	5.2	4.8	5.0

^{1/} Ratings based on the International Potato Chip Institute Color Reference Standard. Each rating is the average of a five member panel.

Table III
1971 Replicated Irish Potato Trials
Delta Branch Experiment Station
Stoneville, Mississippi

After Boiling Ratings - 6/28/71

		Rep. 1	Rep. 2	Mean
BR 6463-2	1	2.2	2.0	2.1
BR 6617-2	2	2.0	2.4	2.2
BR 6626-5	3	3.4	2.4	3.9
BR 6862-2	4	1.6	1.2	1.4
BR 6491-5	5	3.8	1.6	2.7
Alamo - 3041	6	2.4	1.8	2.1
Katahdin - 3089	7	2.1	2.2	2.2
Kennebec - 3090	8	1.4	2.4	1.9
Norchip	9	2.6	1.2	1.9
BR 6820-26	10	1.8	2.0	1.9
BR 6820-29	11	1.6	2.8	2.2
BR 6824-1	12	3.4	2.0	2.7
BR 6851-2	13	2.2	2.0	2.1
BR 5960-5	14	2.8	2.8	2.8
BR 5970-4	15	1.4	2.8	2.1
BR 6306-22	16	1.0	1.2	1.1
Br 6316-5	17	2.0	2.8	2.4
BR 6316-7	18	4.0	2.0	3.0
Seminole	19	3.0	3.6	3.3
BR 6317-21	20	2.8	1.8	2.3
BR 6446-2	21	2.8	2.1	2.5
BR 6448-7	22	3.4	1.6	2.5
BR 6456-1	23	1.4	1.4	1.4
B 6558-16	24	3.0	1.6	2.3
B 6562-14	25	2.8	1.2	2.0
B 6599-1	26	2.2	2.0	2.1
B 6603-12	27	1.4	2.0	1.7
Kennebec	28	2.7	2.2	2.5
Lenape(B 5141-6)	29	2.8	4.2	3.5
LaChipper	30	2.8	1.4	2.1
Alamo	31	1.6	2.4	2.0
Superior	32	2.6	1.4	2.0
L 22-111	33	2.6	1.8	2.2

1 = No darkening

5 = Severe darkening

Visual rating based on average of
5 panel members.

Table IV
1971 Replicated Irish Potato Trials
Delta Branch Experiment Station
Stoneville, Mississippi

Refractometer Readings on Raw Potato
Percent Soluble Solids - 7/1/71

	Rep 1	Rep 2	Mean
BR 6463-2	4.8	5.0	4.9
BR 6617-2	3.4	4.6	4.0
BR 6626-5	4.2	3.8	4.0
BR 6862-2	5.0	3.6	4.3
BR 6491-5	5.4	5.0	5.2
Alamo - 3041	3.4	3.8	3.6
Katahdin - 3089	4.2	3.6	3.9
Kennebec - 3090	5.0	3.8	4.4
Norchip	4.2	5.2	4.7
BR 6820-26	4.0	5.0	4.5
BR 6820-29	4.0	4.0	4.0
BR 6824-1	4.0	4.2	4.1
BR 6851-2	3.8	5.2	4.5
BR 5960-5	4.6	3.8	4.2
BR 5970-4	3.6	3.4	3.5
BR 6306-22	4.5	3.8	4.2
Br 6316-5	4.0	3.8	3.9
BR 6316-7	3.6	4.2	3.9
Seminole	3.6	4.4	4.0
BR 6317-21	4.0	4.1	4.1
BR 6446-2	4.4	4.4	4.4
BR 6448-7	3.6	3.5	3.6
BR 6456-1	3.8	4.0	3.9
B 6558-16	3.6	4.9	4.3
B 6562-14	4.2	4.7	4.5
B 6599-1	3.6	4.0	3.8
B 6603-12	4.0	5.2	4.6
Kennebec	3.8	4.0	3.9
Lenape(B 5141-6)	5.2	5.0	5.1
LaChipper	3.8	3.8	3.8
Alamo	4.4	3.6	4.0
Superior	4.0	3.8	3.9
L 22-111	3.0	5.4	4.2

Table V
1971 Replicated Irish Potato Trials
Delta Branch Experiment Station
Stoneville, Mississippi

Percent Solids on Raw Potatoes
July 1, 1971

	Rep. 1	Rep. 2	Mean
BR 6463-2	22.0	20.0	21.0
BR 6617-2	12.9	15.4	14.2
BR 6626-5	17.6	17.7	17.7
BR 6862-2	17.4	18.5	18.0
BR 6491-5	23.1	21.4	22.3
Alamo - 3041	15.4	16.4	15.9
Katahdin - 3089	16.3	16.9	16.6
Kennebec - 3090	14.1	15.8	15.0
Norchip	18.7	18.3	18.5
BR 6820-26	17.0	18.1	17.6
BR 6820-29	17.4	17.7	17.6
BR 6824-1	18.0	16.4	17.2
BR 6851-2	16.4	21.0	18.7
BR 5960-5	19.1	19.8	19.5
BR 5970-4	16.0	17.9	17.0
BR 6306-22	18.4	18.0	18.2
Br 6316-5	20.1	16.6	18.4
BR 6316-7	19.1	20.6	19.9
Seminole	20.2	21.5	20.9
BR 6317-21	14.8	18.9	16.9
BR 6446-2	15.8	16.7	16.3
BR 6448-7	15.6	14.6	15.1
BR 6456-1	19.9	18.5	19.2
B 6558-16	18.4	18.8	18.6
B 6562-14	24.0	17.8	20.9
B 6599-1	20.3	19.4	19.9
B 6603-12	19.9	21.8	20.9
Kennebec	18.9	15.7	17.3
Lenape(B 5141-6)	23.7	24.0	23.9
LaChipper	17.1	19.2	18.2
Alamo	17.9	16.9	17.4
Superior	16.9	19.6	18.3
L 22-111	13.2	17.4	15.3

Samples dried to constant wt. in 70°C oven 7/1/71.

Percent Solids or Dry Matter.

Table VI
1971 Replicated Irish Potato Trials
Delta Branch Experiment Station
Stoneville, Mississippi

CANNED IRISH POTATOES					
	Shear Press Read- ings	Actual Pounds Shear	Hunter Color		
			L	a	b
BR 6463-2	53.50	16.05	65.55	-2.5	+13.60
BR 6617-2	36.25	10.90	64.60	-1.6	+13.85
BR 6626-5	59.50	17.90	64.55	-1.2	+12.05
BR 6862-2	67.00	20.15	65.10	-0.85	+15.25
BR 6491-5	87.25	26.20	66.10	-2.05	+13.40
Alamo - 3041	45.85	13.75	65.80	-1.40	+14.45
Katahdin - 3089	46.50	13.95	63.80	-1.55	+14.90
Kennebec - 3090	53.25	16.00	65.55	-1.50	+14.00
Norchip	55.00	16.55	62.60	-1.90	+15.75
BR 6820-26	40.50	12.20	65.30	-1.80	+13.50
BR 6820-29	48.15	14.45	66.00	-2.2	+14.05
BR 6824-1	53.50	16.05	63.70	-1.1	+15.50
BR 6851-2	59.25	17.80	63.65	-0.6	+13.65
BR 5960-5	69.00	20.70	64.45	-1.6	+14.15
BR 5970-4	51.60	15.50	66.20	-1.55	+12.65
BR 6306-22	61.00	18.35	66.05	-2.1	+13.5
Br 6316-5	62.8	18.9	66.3	-2.3	+13.2
BR 6316-7	76.0	23.1	65.2	-1.5	+12.7
Seminole	72.5	21.8	65.7	-1.8	+17.9
BR 6317-21	59.5	17.9	65.7	-1.6	+13.3
BR 6446-2	50.0	15.0	64.0	-2.1	+15.5
BR 6448-7	44.3	13.3	65.3	-0.8	+13.1
BR 6456-1	61.0	18.3	66.4	-2.2	+14.3
B 6558-16	62.3	18.7	63.4	-1.9	+14.8
B 6562-14	64.0	19.2	67.0	-1.7	+14.8
B 6599-1	65.5	19.7	66.0	-1.7	+15.8
B 6603-12	95.8	28.8	65.7	-2.1	+15.4
Kennebec	54.0	16.2	64.9	-2.7	+13.0
Lenape(B 5141-6)	80.3	24.1	65.9	-1.8	+13.2
LaChipper	63.3	19.0	66.3	-1.0	+13.2
Alamo	51.5	15.5	65.5	-2.2	+14.9
Superior	53.3	16.0	63.1	-1.4	+16.0
L 22-111	41.3	12.4	64.5	-1.7	+16.1
Commercial Packs:					
Stokley	71.0	21.4	68.6	-3.3	+13.3
Stokley					
Bush					
Bush	65.0	19.5	67.7	-3.6	+14.0

Average of replications 1 and 2.

Table VII
1971 Observational Irish Potato Trials^{1/}
Delta Branch Experiment Station

Entry	Total Yield (Cut)	% No. Ones	Specific Gravity	Overall Rating ^{2/}	Tuber Skin Color
B 5281-1	228	84.6	1.050	3.0	Red
B 6708-1	205	82.9	1.066	3.0	Red
B 6731-2	197	86.8	1.062	3.5	Red
* B 6751-3	326	89.3	1.060	3.0	Red
B 6774-6	271	86.7	1.064	3.0	Red
B 6815-4	251	93.2	1.048	2.0	Red
B 6815-14	237	93.9	1.046	3.0	Red
B 6967-2	247	82.5	1.065	3.5	Red
B 6967-5	190	94.3	1.059	3.5	Red
B 6967-8	255	94.0	1.063	3.5	Red
B 6967-9	263	87.7	1.066	3.0	Red
B 6967-10	111	84.7	1.060	3.5	Red
B 6968-3	249	85.9	1.055	3.5	Red
B 6995-22	223	93.1	1.048	2.5	Red
B 7005-1	251	86.4	1.060	3.0	Red
B 7005-3	275	96.4	1.061	3.5	Red
B 7005-4	260	95.2	1.057	3.5	Red
B 7021-14	136	97.4	1.050	2.5	Red
B 5421-3	228	95.7	1.057	3.0	White
* B 5461-4	312	91.4	1.061	3.0	White
* B 6044-14	226	90.8	1.074	2.5	White
* B 6097-9	316	84.9	1.068	3.0	White
B 6139-11	288	81.0	1.069	2.5	White
B 6495-20	136	83.4	1.064	2.5	White
* B 6503-5	239	92.9	1.070	3.5	White
* B 6516-3	158	87.0	1.072	3.0	White
* B 6516-5	203	87.7	1.071	3.5	White
B 6516-15	200	94.1	1.067	3.5	White
* B 6516-18	200	84.2	1.071	3.0	White
B 6516-19	121	91.0	1.053	3.0	White
* B 6516-20	141	77.1	1.070	3.0	White
* B 6516-26	178	87.9	1.071	3.0	White
B 6516-28	208	84.4	1.063	3.5	White
* B 6516-10	291	86.1	1.073	3.0	White
* B 6532-3	260	88.9	1.074	3.0	White
B 6532.4	233	93.1	1.062	3.0	White
B 6532-10	190	69.7	1.071	3.0	White
* B 6532-14	167	68.8	1.074	2.5	White
B 6587-11	214	91.6	1.067	3.0	White
B 6585-3	128	92.3	1.062	3.0	White
B 6596-3	183	88.8	1.051	3.0	White
B 6698-19	193	83.3	1.068	3.0	White
B 6712-18	192	86.0	1.066	2.5	White
B 6712-23	164	91.2	1.064	3.0	White
B 6887-1	211	92.8	1.056	3.5	White

^{1/} Planted: March 11, 1971; Harvested: June 22, 1971; Graded: June 22, 1971.
Fertilizer: 10-20-20- at 300 lbs./A
Herbicide: Enide (3-11-71) at 5 lbs./A. Plots: 25' x 3.3'.
Insecticide: Thime + (3-11-71) at 30 lbs./A. and Seniss.
Fungicide: Maneb.

^{2/} Overall-Rating: Based on yield, appearance at harvest, cracking, second growth, heat sprouts, rotting, etc.

* Clones retained to be placed in trials next season.

Table VIII
1971 Irish Potato Maturity Rating - DBES
June 1, 1971

Replicated Trials

<u>Treatment</u>	<u>Rating</u>
BR 6463-2	5
BR 6617-2	2
BR 6626-5	4
BR 6862-2	3
BR 6491-5	2
Alamo - 3041	4
Katahdin - 3089	4
Kennebec - 3090	4
Norchip	3
BR 6820-26	3
BR 6820-29	4
BR 6824-1	3
BR 6851-2	2
BR 5960-5	2
BR 5970-4	4
BR 6306-22	1
BR 6316-5	5
BR 6316-7	3
Seminole	2
BR 6317-21	2
BR 6446-2	3
BR 6448-7	2
BR 6456-1	3
B 6558-16	3
B 6562-14	4
B 6599-1	3
B 6603-12	4
Kennebec	4
Lenape (B 5141-6)	3
LaChipper	3
Alamo	3
Superior	2
22-111	2

Observational Trials

B 5281-1	1
B 6708-1	2
B 6731-2	2
B 6751-3	4
B 6774-6	3
B 6815-4	3
B 6815-14	3
B 6967-2	3
B 6967-5	2

<u>Treatment</u>	<u>Rating</u>
B 6967-8	2
B 6967-9	3
B 6967-10	3
B 6968-3	1
B 6995-22	3
B 7005-1	4
B 7005-3	4
B 7005-4	2
B 7021-14	3
B 5421-3	3
B 5461-4	5
B 6044-14	4
B 6097-9	4
B 6139-11	5
B 6495-20	4
B 6503-5	2
B 6516-3	3
B 6516-5	2
B 6516-15	3
B 6516-18	3
B 6516-19	4
B 6516-20	3
B 6516-26	3
B 6516-28	4
B 6518-10	4
B 6532-3	3
B 6532-4	3
B 6532-10	3
B 6532-14	2
B 6587-11	4
B 6685-3	1
B 6696-3	4
B 6698-19	5
B 6712-18	4
B 6712-23	3
B 6887-1	2

Rating - 1 = very early
2 = early
3 = moderate
4 = late
5 = very late

Planted: 3-11-71

Fertilized: 3-9-71 with 400 lbs. 10-20-20.

Insecticide: 30 #/A (3 #/A active) Thimet at planting.

Herbicide: 3-11-71 5 #/A Enide.

NEBRASKA

Oscar S. Malamud and Robert B. O'Keefe

Potato Improvement

Factors Affecting Post-Harvest Market Quality. (Nebr. Project 20-34) Biochemical analyses of tuber samples were made to study genotype and location effects relative to 12 factors or characteristics associated with processing quality, including chip color, dry matter, sugars and protein contents. Samples included 21 varieties and selections from uniform trials in 11 States (NCS Trials) chipped non-chilled, after storage at 40° F for 3 months and reconstituted at 60°-65° F for 5-6 weeks. Mean values of several factors for the 21 selections averaged over 12 locations are presented in table 1. Mean values for each location averaged over all the selections are presented in table 2. In 1970, significant differences were detected among selection and location means. Environmental (location) effects were greater than genotypic effects for most characters. Genotype-environment interactions were evident for dry matter content, protein content and several related factors. Genotype-chipping period (storage condition) interaction for reducing sugars and chip color were also detected. Chip color was found highly negatively correlated with reducing sugar content for each of the three chipping periods. For chip color and reducing sugar content, the correlation between cold storage and reconstitution periods, showed the highest positive value. Addition of 1971 data will permit estimation of genotype, environment and GxE interaction effects and heritabilities and repeatabilities for the 12 factors.

Potato Genetics (Nebraska program contributing to NCR-84). Heat and drought resistance among species, families, clones and within clones were studied for the second year. Resistance was found within Solanum microdontum, S. berthaultii, S. guerreroense and S. kurtzianum (Table 3). Genetic data for 19 vine, floral and tuber characteristics for three locations were processed for estimation of phenotypic, genotypic and environmental variation associated with each character at 2_n and 4_n levels of ploidy.

Heat and drought resistance data will provide estimates of heritability for these and related morphological characters. Gametic and zygotic genetic variation will be estimated for 19 characters in 2_n and 4_n populations.

A complete study of 19 characters in 2_n and 4_n populations, as well as a study of heat and drought resistance in interspecific populations, will be made in 1972.

North Central States Trials: Three advanced clones, Neb 1.57-1 (white), Neb 93.55-16 (white) and Neb 49.62-5 (red), were entered in the North Central States Trials, comprising 12 states, for evaluation and possible release as varieties. The results showed that among 15 entries, the Nebraska clones ranked 5th, 7th and 9th in total yield and 4th, 6th and 8th in yield of US #1 potatoes, respectively. Yields of Neb 1.57-1 and Neb 93.55-16 were slightly below the yield of the standard check variety Cobbler. Neb 1.57-1 produced high yields in Michigan, Ohio, Wisconsin and western Nebraska. Neb 93.55-16 yielded very well in Kansas. This clone showed the second highest value over all locations in percent total solids and was early maturing in Indiana, Kansas, Louisiana and Minnesota.

All three Nebraska entries showed good chipping quality when chipped non-chilled after harvest. In over-all merit as a variety, Neb 1.57-1 ranked second, preceded only by Norland.

Nebraska Project 20-34 contributing to NCM-45 - 1971.

Nebraska Table 1. Factors affecting post-harvest marketing quality of processed potatoes. Means of selections (over 12 locations).

Code	Selection	Percent				Chip color (Rd) ^{2/}	
		Total solids ^{1/}	Protein on dry wt. basis	Total sugars	Reducing sugars	Original ^{3/}	Reconstituted ^{4/}
1	Minn 174	18.6	3.92	0.49	0.22	43.9	40.4
2	Minn 1317	16.7	3.96	0.58	0.27	39.4	33.7
3	Minn 4086	17.7	4.24	0.74	0.32	37.9	35.6
4	B5267-2	18.0	4.57	0.60	0.30	39.7	39.3
5	B6039-1	18.9	5.50	0.53	0.19	40.9	28.8
6	B6044-14	20.3	5.08	0.73	0.31	39.0	38.9
7	Wisc 634	18.4	3.64	0.54	0.21	39.7	37.1
8	Wisc 664	19.2	4.40	0.80	0.39	35.9	31.8
9	Neb 99.56-4x	17.7	5.53	0.52	0.21	43.2	31.3
10	Neb 92.56-4	18.2	4.24	0.63	0.30	39.2	35.8
11	Neb 91.57-H18	17.7	4.70	1.09	0.54	29.2	29.0
12	La 51-2	18.2	5.21	0.68	0.32	37.0	33.1
13	La 22-111	16.7	4.46	0.67	0.34	35.6	36.0
14	Mich S709	17.2	4.47	0.84	0.41	33.5	23.7
15	Mich S503	19.2	5.45	0.77	0.31	38.6	29.1
16	ND 6993-13 Russ	18.6	4.99	0.59	0.26	39.3	33.4
17	ND 7196-18	18.1	4.78	0.53	0.27	43.2	32.8
18	ND 5922-12	17.8	4.49	0.65	0.29	38.0	39.7
19	Red Pontiac	15.9	4.20	1.15	0.59	31.2	26.7
20	Cobbler	16.4	4.64	0.76	0.37	36.0	31.6
21	Norland	18.1	4.74	0.87	0.49	34.1	30.0
	MEAN	18.0	4.63	0.70	0.33	37.8	33.2

^{1/} Determined by the hydrometer method.

^{2/} Rd: determined by the reflectance method using a white standard of Rd = 90.1. Values of 35 or higher are acceptable for potato chips.

^{3/} Determined soon after crop harvest.

^{4/} Determined after storing potatoes for four weeks at 60° F following three months of storage at 40° F.

Nebraska Project 20-34 contributing to NCM-45 - 1971.

Nebraska Table 2. Factors affecting post-harvest marketing quality of processing potatoes. Means of locations (over 21 selections).

Location	Percent				Chip color (Rd) <u>2/</u>	
	Total solids <u>1/</u>	Protein on dry wt. basis	Total sugars	Reducing sugars	Original <u>3/</u>	Reconstituted <u>4/</u>
1 Louisiana	16.8	5.32	1.36	0.67	26.0	26.9
2 Missouri	<u>20.8</u>	4.68	1.33	0.44	30.2	36.6
3 Kansas	<u>19.0</u>	2.98	0.59	0.21	41.8	28.1
4 Nebraska (summer)	17.5	4.32	0.84	0.37	40.6	38.0
5 Iowa	15.4	2.77	0.72	0.31	40.8	23.9
6 Indiana	17.2	5.24	0.79	0.32	39.8	31.0
7 Ohio	15.3	6.67	0.40	0.19	40.0	35.9
8 South Dakota	18.5	<u>6.81</u>	0.44	0.21	48.1	43.8
9 North Dakota	20.1	<u>3.90</u>	0.65	0.42	31.5	41.3
10 Wisconsin	17.9	4.12	0.70	0.39	33.6	29.6
11 Nebraska (fall)	19.5	4.11	0.33	0.24	38.7	30.6
12 Michigan	17.8	4.64	0.27	0.17	<u>42.9</u>	32.8
MEAN	18.0	4.63	0.70	0.32	37.8	33.2

1/ Determined by the hydrometer method.

2/ Determined by the reflectance method, using a white standard of Rd = 90.1.
Values of 35 or higher are acceptable for potato chips.

3/ Determined soon after crop harvest.

4/ Determined after storing potatoes for four weeks at 60° F following three months of storage at 40° F.

NEBRASKA TABLE 3. SOLANUM SPECIES AND FAMILIES WITH RESISTANCE

TO HEAT AND DROUGHT IN 1970-1971 TESTS 1/

<u>Species</u>	<u>Rating 2.5 or less</u>		<u>Families P.I. Number</u>
	<u>1970</u>	<u>1971</u>	
S. acaule	x		266386
S. berthaultii			310926
		x	310927
	x		310971
S. boliviense	x		WRF 1561
S. brachycarpum	x		275183
S. brevicaule	x		310931 <u>2/</u>
S. bulbocastanum	x		275187
	x		275194
	x		275196
		x	347157
	x		WRF 1575
S. cajamarcense	x		310988
S. chacoense	x		320282
	x		320283
	x		320285
	x		320286
	x		320287
	x		320289
	x		320290
		x	WRF 976
S. demissum	x		275206 <u>2/</u>
		x	347760
S. guerreroense	x	x	161727
	x		161730
S. kurtzianum		x	320296
S. megistacrolobum		x	265578 <u>2/</u>
	x		265873
		x	283082
S. microdontum	x		320304
	x		320305
	x		320306
	x		320314
			320315
		x	320317
		x	320319
S. mochicense		x	338616
S. multidissectum		x	210042
	x		210043
S. pampasense		x	275275
S. papita	x		262895
	x		283102
	x		283143
S. pinnatisectum	x		275232
	x		275236
		x	347766
S. polyadenium	x		320342

NEBRASKA TABLE 3. SOLANUM SPECIES AND FAMILIES WITH RESISTANCE

TO HEAT AND DROUGHT IN 1970-1971 TESTS (cont.) 1/

<u>Species</u>	<u>Rating 2.5 or less</u>		<u>Families</u>
	<u>1970</u>	<u>1971</u>	<u>P.I. number</u>
S. polytrichon	x		255522
S. raphanifolium	x		265862
S. sanctae-rosae		x	205397 <u>2/</u>
S. sparsipilum	x		265859
		x	265869
		x	246536
S. spegazzinii		x	208562
		x	208876
S. stoloniferum	x		320343
		x	283109
S. vernei			320329
S. verrucosum			195170

1/ Received from IR-1 and tested in Nebraska. Based on a plant damage rating of 2.5 or less (Rating 1 to 4; 1 = 0 - 25% damage; 4 = 75 - 100% damage).

2/ Frost resistance in those introductions reported elsewhere.

Outstate Variety Trials - 1970 Season. Twenty-one standard and new potato varieties and clones from Nebraska and other States were evaluated for production and processing quality in late summer and fall crops areas of Nebraska in 1970. The data presented in Table 4 show mean values for several characteristics at both locations. Table 5 ranks the top five entries at each location.

Outstate Variety Trials - 1971 Season. Thirteen varieties from Nebraska and other states were tested in 1971 season in the late summer and fall crop areas. Mean values for several characteristics are presented in Table 6. Table 7 ranks the top five entries at each location. In 1971 eight varieties were repeats from the 1970 trials, and five were new entries-Shurchip, Raritan, Sioux, York and Abnaki. Eight additional varieties from the 1970 tests were also included in the field, but their field performance could not be evaluated due to seed-inhibitor effects on plant growth and yield. Mean yields for the late summer crop were significantly lower than in 1970. Cold weather early in the season and a short period of hot-dry days in mid-season adversely affected yields and increased disease incidence, especially for Rhizoctonia.

For the fall season, total yields were equal or slightly lower than in 1970. Percent US #1's was significantly higher.

Late Summer Crop. Norchip, Shurchip, Bounty and Norland showed the highest performance in over-all rating. They were the highest in total yield and percentages of US #1's. When chipped directly following harvest, Norchip, Haig, Bounty, York and Superior produced the highest color of chips.

Of the new varieties, Raritan and York were high in total solids content. Due to late planting, yield capabilities of York and Abnaki could not be fully determined.

Fall Crop. Norchip, Haig, Shurchip and Raritan were the outstanding varieties when rated over-all characteristics. Sioux produced the highest total yield. The new varieties Abnaki and York were high in total yields and percentages of US #1 tubers. Raritan was the highest in total solids, followed by York and Sioux. Haig, Shurchip, Superior and Norland yielded the highest chips when processed immediately after harvest. Differences in chip color among all varieties tested were very slight. All showed acceptable values except Sioux and Raritan.

Breeding and Selection Programs. One hundred and eighty-two breeding clones were evaluated for yield, scab resistance, reaction to Verticillium and Fusarium wilts and processing quality. Presently, they are being screened for tuber and foliage reaction to the Late Blight fungus (Phytophthora infestans). With available data, selection and seed increase of the most promising clones is projected for next year. Eleven thousand seedlings were planted as first year clones and evaluated for horticultural characteristics. The selected clones will be carried into the usual evaluation trials. Twelve Russet clones, originated in other States and reselected for the second year in Nebraska, were evaluated for yield and processing quality.

Disease Screening. Commercial growers' tuber samples were evaluated for the presence of fungal organisms associated with storage rots. Verticillium dahliae, Fusarium sp., Alternaria solani and Spondilocladium atrovirens were detected.

Disease Research Performed by the Department of Plant Pathology. An Association of Mycoplasma with Haywire disorder of potatoes was reported. Healthy growth resulted after administration of chlorotetracycline. A vector search for the disease showed that some leafhopper species present in areas of Nebraska where the disorder was detected are known as vectors of mycoplasma diseases. The genus Aceratagallea was considered the main suspect.

The disease was graft-transmitted to tomato, which showed yellows with leaf stunting and epinasty but not "big bud" symptoms. Culture of the causal organism "in-vitro" were not successful. Several new media will be tested in the future.

NEBRASKA TABLE 4. STANDARD AND NEW POTATO VARIETIES - OUTSTATE TESTS - 1970.
YIELD PERFORMANCE AND PROCESSING CHARACTERISTICS.

Variety	Location	Color	Maturity	Scab type	Total yield Cwt/A	U.S. #1 %	Solids %	Chip		Original 1/ %		40°F 2/ Storage		Recon. 3/ 65°F	
								Yield %	Oil %	Chip Color	Sugar	Chip Color	Sugar	Chip Color	Sugar
Haig	14/ 2	White	4.5 3	2 1	260	72	18.4	34	30	4	--	5	0.36	7	0.42
					337	66	19.4	31	37	3	0.17	10	0.81	7	0.63
					298	69	18.9	33	34	3.5	0.17	7.5	0.58	7	0.52
Kennebec	1 2	White	5.5 5	5 2	208	63	16.9	31	36	6	--	5	0.43	6	0.15
					436	24	19.9	38	28	3	0.08	8	0.87	3	0.26
					322	44	18.4	35	32	4.5	0.08	6.5	0.65	4.5	0.20
Norland	1 2	Red	3 2	4 1	313	55	15.4	30	36	7	--	8	1.00	8	0.58
					231	80	16.6	29	25	4	0.28	10	1.10	6	0.46
					272	68	16.0	30	31	5.5	0.28	9	1.05	7	0.52
Bounty	1 2	Red	5 5	5 1	275	43	16.7	32	36	6	--	9	0.69	7	0.43
					469	44	19.6	35	31	3	0.27	10	1.47	8	0.91
					372	44	18.1	34	34	4.5	0.27	9.5	1.08	7.5	0.67
Rus. Burbank	1 2	Russet	5 4	1 2	162	39	17.6	38	30	7	--	7	0.62	7	0.28
					348	40	21.3	36	32	3	0.21	8	0.66	4	0.15
					255	40	19.4	37	31	5	0.21	7.5	0.64	5.5	0.21
Superior	1 2	White	3.5 3	3	246	82	18.6	34	29	3		7	0.04	6	0.35
					301	63	20.2	33	36	4	0.06	6	0.37	8	0.55
					273	73	19.4	34	33	3.5	0.06	6.5	0.20	7	0.45
93.55-16	1 2	White	5	2	234	67	19.3	36	41	5	--	6	0.24	4	0.12
					346	76	21.1	35	32	3	0.19	8	0.57	6	0.22
					290	72	20.2	36	37	4	0.19	7	0.40	5	0.17
1.57-1	1 2	White	4 3	2 1	310	80	18.3	31	34	5	--	6	0.47	5	0.22
					263	62	20.1	35	33	2	0.10	7	0.68	8	0.48
					286	71	19.2	33	34	3.5	0.10	6.5	0.57	6.5	0.35

NEBRASKA TABLE 4 (CONT.). STANDARD AND NEW POTATO VARIETIES - OUTSTATE TESTS - 1970.
YIELD PERFORMANCE AND PROCESSING CHARACTERISTICS.

Variety	Location	Color	Maturity	Scab type	Yield Total Cwt/A	#1 Solids %	Chip		Original 1/		40°F 2/		Recon. 3/	
							Yield	Oil	Chip	Sugar	Chip	Sugar	Chip	Sugar
49.62-5	1	Red	4.5	2	255	80	32	36	--	--	3	0.15	4	0.11
	2		3	1	313	63	36	27	0.06	0.06	6	0.31	4	0.20
	Av.				284	72	34	32	0.06	0.06	4.5	0.23	4	0.15
Peconic	1	White	5	2	227	55	34	30	--	--	6	0.20	4	0.10
	2				300	69	36	30	0.12	0.12	7	0.44	4	0.13
	Av.				263	62	35	30	0.12	0.12	6.5	0.32	4	0.11
Pride	1	White			--	--	--	--	--	--	--	--	--	0.47
	2				285	79	37	30	0.27	0.27	9	0.80	6	0.40
	Av.				285	79	37	30	0.27	0.27	9	0.80	6	0.40
Jewel	1	White			--	--	--	--	--	--	--	--	--	--
	2				272	73	33	33	0.06	0.06	3	0.14	3	0.05
	Av.				272	73	33	33	0.06	0.06	3	0.14	3	0.05
Iopride	1	White	4	1	287	74	30	35	--	--	6	1.05	6	--
	2				266	71	31	35	0.16	0.16	10	0.81	7	0.70
	Av.				276	73	31	35	0.16	0.16	8	0.93	6.5	0.70
Seminole	1	White	4.5	3	268	42	34	33	--	--	5	0.58	5	0.67
	2				240	57	40	40	0.23	0.23	5	0.41	5	0.27
	Av.				254	50	37	--	0.23	0.23	5	0.49	5	0.47
Cascade	1	White	5	2	248	71	29	40	--	--	7	0.68	8	0.27
	2				356	60	34	27	0.18	0.18	7	0.53	7	0.35
	Av.				302	66	32	34	0.18	0.18	7	0.60	7.5	0.31
Chieftan	1	Red	5	5	287	57	25	41	--	--	10	0.55	8	0.86
	2				376	58	31	37	0.25	0.25	10	1.17	8	0.70
	Av.				331	58	28	39	0.25	0.25	10	0.86	8	0.78

NEBRASKA TABLE 4 (CONT.). STANDARD AND NEW POTATO VARIETIES - OUTSTATE TESTS - 1970.
YIELD PERFORMANCE AND PROCESSING CHARACTERISTICS.

Variety	Location	Color	Maturity	Scab type	Total Yield Cwt/A	U.S. #1 %	Solids %	Yield %	Oil %	Chip Color	% Sugar	Chip Color	% Sugar	Chip Color	% Sugar
Norchip	1	White	4	5	287	65	18.0	34	31	4	--	5	0.37	7	0.69
	2				370	66	22.1	34	32	2	0.07	4	0.16	3	0.09
	Av.				328	66	20.0	34	31	3	0.07	4.5	0.26	5	0.39
Mayfair	1	White	4.5	3	278	73	16.3	28	37	7	--	9	0.52	8	0.84
	2				329	55	19.7	35	32	4	0.12	10	1.27	8	0.59
	Av.				303	64	18.0	32	34	5.5	0.12	9.5	0.89	8	0.71
General	Central City (1)				259	63	17.6	32	35	5.7	--	6.5	0.50	6.2	0.40
Mean:	Alliance (2)				324	61	20.4	34	32	2.9	0.16	7.7	0.70	5.8	0.39

- 1/ Soon after harvest.
2/ Stored 3 months at 40°F.
3/ Reconstitution period of 4-5 weeks at 65°F.
4/ Location 1: Central City (late summer)
Location 2: Alliance (fall)

Nebraska Table 5. Summary of performance of standard and new varieties - Top ratings. Outstate potato variety trials - 1970.

Total yield Cwt/A	Percent		Chip color ¹ / Original ² /		Percent reducing sugar		Over- all rating
	U.S. #1	Chip yield	Original ² /	Reconst. 3/ Reconst. 3/	Original ² / Reconst. 3/	Reconst. 3/ Reconst. 3/	
<u>CENTRAL CITY (late summer)</u>							
Norland	Superior	Rus. Burbank	Superior	Neb 93.55-16	--	Peconic	Superior
Neb 1.57-1	Neb 1.57-1	Neb 93.55-16	Neb 49.62-5	Neb 49.62-5	--	Neb 49.62-5	Neb 1.57-1
Iopride	Neb 49.62-5	Haig	Norchip	Peconic	--	Neb 93.55-16	Norland
Chieftain	Iopride	Superior	Haig	Neb 1.57-1	--	Kennebec	Mayfair
Norchip	Mayfair	Peconic	Neb 93.55-16	Seminole	--	Neb 1.57-1	Haig
<u>ALLIANCE (fall)</u>							
Bounty	Norland	Seminole	Neb 1.57-1	Norchip	Superior	Jewel	Norchip
Kennebec	Pride	Kennebec	Neb 49.62-5	Kennebec	Neb 49.62-5	Norchip	Neb 93.55-16
Chieftain	Neb 93.55-16	Rus. Burbank	Peconic	Jewell	Jewell	Peconic	Peconic
Norchip	Jewel	Neb 93.55-16	Iopride	Peconic	Norchip	Rus. Burbank	Neb 49.62-5
Rus. Burbank	Iopride	Pride	Norchip	Neb 49.62-5	Kennebec	Neb 49.62-5	Jewel

1/ Determined by the PCII standard color chart.

2/ Soon after harvest.

3/ Reconstitution period of 4-5 weeks at 65° F following cold storage.

NEBRASKA TABLE 6. STANDARD AND NEW POTATO VARIETIES - OUTSTATE TESTS - 1971

Variety	Location	Color	Maturity ^{4/}	Total Yield Cwt/A	U.S. #1 %	Solids %	Chip		General merit rank	Comments ^{3/}
							Yield %	PCI color ^{2/}		
Haig	11/	White	1.0	137	70	18.7	34.8	3	2	Fusarium or Rhizoctonia affected. Very good type; excellent size.
	2		2.0	329	90	18.0	32.5	2		
	Av.			233	80	18.3	33.6	2.5		
Kennebec	1	White	4.0	160	62	20.9	29.7	4		High gravity; low yield. Second growth. Oversize
	2		3.5	302	58	18.9	30.1	3		
	Av.			231	60	19.9	29.9	3.5		
Norland	1	Red	2.0	200	71	15.8	34.0	4	3	Poor color
	2		1.5	312	86	17.5	29.9	2		
	Av.			256	78	16.6	31.9	3		
Bounty	1	Red	3.0	242	57	15.7	29.0	3	4	Oversize
	2		2.5	335	80	19.3	29.5	3		
	Av.			288	68	17.5	29.2	3		
Rus. Burbank	1	Russet	3.5	141	37	16.8	29.2	7		Poor type. Off type; second growth.
	2		3.5	270	53	18.2	30.5	3		
	Av.			205	45	17.5	29.8	5		
Superior	1	White	2.5	195	67	17.6	31.2	3	5	Irregular Oversize - Rot
	2		1.8	272	66	18.8	29.2	2		
	Av.			233	66	18.2	30.2	2.5		
Shurchip	1	White	3.0	214	71	16.1	28.9	4	2	Good type.
	2		2.0	312	88	19.1	31.6	2		
	Av.			263	80	17.6	30.2	3		
Raritan	1	White	3.5	155	58	20.3	35.6	6	4	High gravity; late; plant vigor. Good type; high specific gravity.
	2		3.0	291	68	20.5	35.0	4		
	Av.			223	63	20.4	35.3	5		

NEBRASKA TABLE 6. STANDARD AND NEW POTATO VARIETIES - OUTSTATE TESTS - 1971 (CONT.)

Variety	Location	Color	Maturity ^{4/}	Total yield Cwt/A	U.S. #1 %	Solids %	Chip PCI Yield color ^{2/} %	General merit rank	Comments ^{3/}
Norchip	1	White	2.5	260	69	18.9	36.1	3	Good type & yield.
	2		1.8	327	86	19.5	33.6	3	Excellent type & fair size.
	Av.			293	78	19.2	34.8	3	
Cascade	1	White	2.8	--	41	--	29.7		
	2		--	--	--	--	--		
	Av.						29.7		
Sioux	1	D. red	1.5	185	70	20.0	34.9	4	Poor color.
	2		2.3	349	83	20.0	31.6	4	Oversize; good type; high gravity.
	Av.			267	77	20.0	33.2	4	
York	1	White	1.5	114	62	19.7	30.8	3	Planted late; high gravity.
	2		1.5	195	90	21.5	34.9	3	Low yield
	Av.			154	76	20.6	32.8	3	
Abnaki	1	White	4.0	143	64	16.8	32.0	4	Plant vigor. Planted late.
	2		4.0	339	76	18.7	31.7	3	High yield; rot.
	Av.			241	70	17.7	31.8	3.5	
General mean:	Central City	2.7		178	63	18.1	32.1	4.0	
	Alliance	2.4		302	77	19.1	31.6	2.8	

1/ 1 - Central City: Planted 4-15-71; harvested 8-4-71.

2 - Alliance: Planted 5-21-71; harvested 9-5-71.

2/ Standard color chart Potato Chip International Institute.

3/ No detectable scab was observed in the overall test at both locations.

4/ 1 - Very early - Norland maturity

2 - Early - Irish Cobbler maturity

3 - Medium - Red Pontiac maturity

4 - Late - Katahdin maturity

5 - Very late - Kennebec or Russet Burbank maturity

Nebraska Table 7. Summary of performance of standard and new varieties -
Top five ratings. Outstate potato variety trials - 1971.

	Total yield Cwt/A	Percent		Chip yield	Chip color ^{2/} Original	Over- all rating
		U.S. #1	Total solids ^{1/}			
CENTRAL CITY (late summer)	Norchip	Shurchip	Kennebec	Norchip	Norchip	Norchip
	Bounty	Norland	Raritan	Raritan	York	Shurchip
	Shurchip	Sioux	Sioux	Sioux	Haig	Norland
	Norland	Haig	York	Haig	Superior	Superior
	Superior	Norchip	Norchip	Norland	Bounty	Sioux
ALLIANCE (fall)	Sioux	Haig	York	Raritan	Haig	Norchip
	Abnaki	York	Raritan	York	Norland	Haig
	Bounty	Shurchip	Sioux	Norchip	Superior	Shurchip
	Haig	Norchip	Norchip	Haig	Shurchip	Raritan
	Norchip	Norland	Bounty	Abnaki	Norchip	Sioux

^{1/} Determined by the potato hydrometer method.

^{2/} Determined soon after harvest. Ratings according to the PCII standard color chart.

NEW JERSEY

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Campbell Institute for Agricultural Research

Approximately 37,000 first-year seedlings were grown on the potato breeding farm at Perham in Aroostook County, Maine from which 1659 selections were made at harvest. Two hundred and sixty-two clones were selected from 1540 second-year seedlings in 16-hill plots. An additional 300 were saved for later decision based on processing potential. From 246 third-year clones grown in either 60 or 100-hill plots, 102 were saved for processing tests. Fourth-year and older selections were planted in variety trials and seed increase plots.

Clones identified with a BR prefix are selections from crosses made independently in Campbell greenhouses and selected and maintained on the USDA Chapman, Maine Farm during the period of a cooperative agreement for potato breeding between the USDA and Campbell Soup Company.

Data reported are from replicated variety trials in California, Indiana, Maine, New Jersey, Ohio, Oregon, Pennsylvania, South Carolina and Virginia. Planting and harvest dates, fertilization and cultural practices were similar to those for the different areas. Samples were shipped to the Cinnaminson, New Jersey Laboratory for subsequent storage and processing tests.

Campbell Table 1. Yield, specific gravity, tuber rating and chip color of varieties evaluated for soups - Perham, Maine --1971

Variety	Yield above 2"		S. G. ^{1/}	Tuber Rating ^{2/}	Chip Color ^{3/}	
	Cwt./A	%			2 Weeks	4 Weeks
BR6835- 1E	341	81	73	3	10.0	9.9
BR6835- 4E	322	82	75	3+	10.0	10.0
BR6835- 5E	327	81	69	3	10.0	10.0
BR6850-16E	366	85	71	3+	10.0	10.0
BR6850-21E	235	90	70	3+	10.0	8.7
BR6850-23E	319	90	80	3	10.0	10.0
BR6862- 8E	277	90	71	3	10.0	10.0
BR6864- 1E	478	94	76	3+	10.0	10.0
BR6864- 4E	268	89	79	3	9.7	9.9
BR6864- 5E	373	88	79	3+	10.0	10.0
BR6864- 8E	312	90	76	4	10.0	9.5
BR6864- 9E	421	87	74	3+	10.0	10.0
BR6864-12E	280	73	74	3+	10.0	10.0
BR6864-13E	315	76	75	4	10.0	10.0
BR7049- 5	427	97	83	3+	10.0	10.0
BR7051-10	288	87	81	3	10.0	9.8
BR7056- 6	344	90	65	4	10.0	10.0
BR7068- 3	361	95	80	3	10.0	9.5
BR7091- 1	448	95	67	4	10.0	10.0
BR7104-10	400	89	75	4+	10.0	7.2
BR7108- 2	368	92	89	3+	10.0	9.5
BR6261- 1	302	93	65	4	10.0	10.0
Katahdin	328	93	68	3+	10.0	10.0
Wauseon	392	93	72	3+	10.0	9.5
Mean	346	88	74			
LSD (.05)	53	4	4			
(.01)	70	6	6			

^{1/} 1.0 deleted

^{2/} 1 = Poor to 5 = Excellent

^{3/} Chip color tests by Dr. R. V. Akeley.
Samples from two replicates were held at 38° F from harvest to November 17 and 18, followed by reconditioning at 70° F for two and four weeks. 1 = Light to 10 = Dark Brown.

Campbell Table 2. Yield, specific gravity, tuber rating and chip color of varieties evaluated for soups - Perham, Maine--1971 ^{1/}

Variety	Yield above 2"		S. G.	Tuber Rating	Chip Color	
	Cwt./A	%			2 Weeks	4 Weeks
BR5960- 5	362	94	85	4	9.6	9.9
BR6306-22	388	93	71	3	10.0	10.0
BR6317-21	331	90	72	4	10.0	10.0
BR6446- 2	402	97	71	3	10.0	10.0
BR6456- 1	309	88	71	4	10.0	10.0
BR6820-10	380	86	71	4	10.0	10.0
BR6820-16	365	89	67	4	10.0	10.0
BR6820-24	381	86	70	4	10.0	10.0
BR6820-26	378	89	70	4	10.0	10.0
BR6822- 5	346	94	74	4	10.0	10.0
BR6858- 2	369	94	65	3	10.0	10.0
BR6862- 2	332	95	82	4	9.8	10.0
BR6864- 8	358	90	73	3+	10.0	10.0
BR6864- 9	374	92	76	4	10.0	10.0
BR6862- 5E	390	91	77	3+	10.0	10.0
BR6863- 2E	454	95	80	3	10.0	10.0
BR6863- 8E	308	84	88	3+	9.0	7.3
BR6864- 6E	385	92	73	3	10.0	10.0
BR6864- 7E	335	84	69	3	10.0	10.0
BR6864-11E	392	87	71	3+	10.0	10.0
Katahdin	296	91	72	3+	10.0	10.0
Wauseon	383	94	74	3	10.0	9.8
Mean	364	91	74			
LSD (.05)	45	3	4			
(.01)	59	4	6			

^{1/} See footnotes Table 1.

Campbell Table 3. Yield, specific gravity and tuber rating of varieties evaluated for soups - Shirley, New Jersey--1971

Variety	Yield above 2"		S. G. ^{1/}	Tuber Rating ^{2/}
	Cwt./A	Percent		
BR6306-22	331	80	55	1+
BR6317-21	324	78	64	2
BR6446- 2	312	88	69	3
BR6456- 1	270	74	66	3+
BR6820-10	232	62	65	2
BR6820-16	215	60	60	3+
BR6820-24	147	40	58	2
BR6820-26	249	59	60	2+
BR6822- 5	270	77	67	3+
BR6858- 2	331	87	50	1+
BR6864- 8	340	71	58	2
BR6864- 9	333	77	64	2+
BR6850-13E	292	64	58	1+
BR6862- 5E	249	62	50	1+
BR6863- 2E	452	85	65	2+
BR6863- 8E	331	77	66	2+
BR6863-12E	308	77	67	3
BR6864- 6E	327	80	63	4
BR6864- 7E	168	63	57	3
BR6864- 8E	245	60	55	1
BR6864- 9E	319	73	59	1+
BR6864-11E	309	68	55	2
Katahdin	274	79	51	2+
Wauseon	235	77	56	3
Mean	286	72	60	
LSD (.05)	65	7	6	
(.01)	86	10	8	

^{1/} 1.0 deleted

^{2/} 1 = Poor to 5 = Excellent

Campbell Table 4. Yield, specific gravity and tuber rating of varieties evaluated for soups - LaForte, Indiana--1971

Variety	Yield above 2"		S. G. ^{1/}	Tuber Rating ^{2/}
	Cwt./A	Percent		
BR5960- 5	497	96	68	3+
BR6306-22	392	93	58	2+
BR6317-21	372	93	58	3
BR6446- 2	423	94	63	2
BR6456- 1	482	94	61	3
BR6820-10	335	83	66	2+
BR6820-16	336	86	53	4
BR6820-24	353	82	55	4
BR6820-26	523	90	59	3+
BR6822- 5	288	85	62	2
BR6858- 2	487	93	53	1+
BR6864- 8	358	90	59	3
BR6864- 9	422	92	61	3+
BR6862- 5E	419	95	62	3
BR6863- 2E	681	95	72	3+
BR6864- 6E	383	92	60	3
BR6864- 7E	274	90	59	3
BR6864-11E	464	93	60	4
Katahdin	422	96	65	3
Wauseon	322	90	60	3
Mean	412	91	61	
LSD (.05)	109	3	5	
(.01)	145	5	6	

^{1/} 1.0 deleted

^{2/} 1 = Poor to 5 = Excellent

Campbell Table 5. Yield, specific gravity and tuber rating of varieties evaluated for soups - Napoleon, Ohio--1971

Variety	Yield above 2"		S. G. ^{1/}	Tuber Rating ^{2/}
	Cwt./A	Percent		
BR5960- 5	340	85	75	3+
BR6306-22	242	67	60	2
BR6317-21	277	75	65	3+
BR6446- 2	307	84	71	3
BR6456- 1	318	78	74	3+
BR6820-10	322	78	71	3+
BR6820-16	291	73	64	4
BR6820-24	165	49	61	3
BR6820-26	313	73	67	3+
BR6822- 5	335	86	74	3+
BR6858- 2	270	85	61	2
BR6864- 8	226	70	64	2
BR6864- 9	276	81	70	3+
BR6862- 5E	256	64	72	3
BR6863- 2E	408	87	74	3
BR6864- 6E	271	75	67	3+
BR6864- 7E	111	55	55	2
BR6864-11E	287	75	70	3
Katahdin	311	85	64	3+
Wauseon	371	93	67	3
Mean	285	76	67	
LSD (.05)	67	8	6	
(.01)	89	11	7	

^{1/} 1.0 deleted

^{2/} 1 = Poor to 5 = Excellent

Campbell Table 6. Yield and tuber rating of varieties evaluated for soups - Arvin, California--1971

Variety	Yield above 2"		Tuber Rating	
	Cwt./A	Percent	Smoothness ^{1/}	Size ^{2/}
BR6456- 1	360	87	3+	2
BR6626- 5	466	88	3+	4
BR6820-16	242	77	3+	3
BR6820-24	318	81	3+	2
BR6820-26	448	85	4	3
BR6858- 2	200	84	3	2
BR6862- 2	362	89	4	3
BR6835- 4E	264	76	2+	2
BR6835- 5E	254	85	2+	3
BR6850-16E	230	70	3	1
BR6850-23E	178	76	3	1
BR6862- 5E	354	93	4	4
BR6862- 8E	284	84	3+	4
BR6864- 1E	226	78	3+	2
BR6864- 4E	226	78	3+	2
BR6864- 5E	292	80	4	1
BR6864- 8E	280	86	3+	2
BR6864- 9E	340	87	3+	2
BR6864-12E	158	52	3+	1
BR6864-13E	250	78	4	2
Kennebec	430	92	4	4
White Rose	400	82	2+	3+

LSD (.05)	55	6
(.01)	73	8

^{1/} Rating 1-5, 5 Best

^{2/} Rating 1-5, 5 Largest

Campbell Table 7. Yields and tuber rating of varieties evaluated for soups - Klamath Falls, Oregon--1971 ^{1/}

Variety	Yield above 2"		Tuber Rating	
	Cwt./A	Percent	Smoothness ^{2/}	Size ^{3/}
BR6456- 1	339	89	4+	5
BR6626- 5	404	88	4+	4+
BR6820-16	332	84	4	4+
BR6820-24	284	79	3	3+
BR6820-26	451	85	4	4+
BR6858- 2	188	90	4	4
BR6862- 2	298	93	4	4+
BR6835- 4E	223	79	3+	3
BR6835- 5E	240	82	3	3
BR6850-16E	224	72	2+	3+
BR6850-23E	163	66	3+	2
BR6862- 5E	365	85	3	5
BR6862- 8E	159	71	3+	3
BR6864- 1E	347	73	2	4+
BR6864- 4E	236	85	3	4
BR6864- 5E	295	82	2+	4
BR6864- 8E	237	81	3	3+
BR6864- 9E	459	83	2+	4+
BR6864-12E	195	64	4	2+
BR6864-13E	169	75	3	3
A 503 -42	264	82	3+	4
Kennebec	433	75	3	5
R. Burbank	185	58	2	2+
LSD (.05)	88	9		
(.01)	116	12		

^{1/} Cooperative trial with Mr. George Carter, Klamath Branch Experiment Station, Klamath Falls, Oregon.

^{2/} Rating 1-5, 5 Smoothest

^{3/} Rating 1-5, 5 Largest

Campbell Table 8. Yield, specific gravity, tuber rating and chip color of varieties in early and medium trial - Perham, Maine

Variety	Yield above 2"		S. G. ^{1/}	Tuber Rating ^{2/}	Chip Color ^{3/}	
	Cwt./A	%			2 Weeks	4 Weeks
BR6319-14	291	93	68	3	10.0	10.0
BR6319-21	142	78	75	4	10.0	9.8
BR6442- 1	147	83	72	3+	10.0	10.0
BR6448- 7	359	96	70	3	9.9	10.0
BR6835- 6E	288	91	72	3+	10.0	10.0
BR6838- 1E	227	84	75	3+	10.0	10.0
BR6838- 2E	276	95	68	3	10.0	10.0
BR6838- 4E	262	86	72	3+	10.0	10.0
BR6862- 3E	238	81	80	3	10.0	10.0
BR6863- 4E	222	84	73	3+	10.0	9.0
BR6863-12E	282	91	80	4	9.5	10.0
BR7051- 4	238	79	84	4	10.0	9.6
BR7052- 3	241	80	73	3+	10.0	10.0
BR7061- 3	289	92	76	3	10.0	10.0
BR7068- 4	180	91	90	4	9.0	9.6
BR7070- 3	282	89	71	3	8.6	8.2
BR7071- 4	281	93	78	4	9.5	9.0
BR7072-12	310	92	74	4	9.7	10.0
BR7082- 2	343	87	73	3	10.0	10.0
BR7093-10	198	98	66	4	10.0	10.0
BR7097- 1	261	96	84	4	8.7	9.1
BR7097- 2	282	92	81	4	8.6	9.1
BR7098- 2	333	96	66	5	9.9	10.0
BR7103- 2	383	98	80	4	10.0	10.0
BR6477- 4	174	83	76	3+	10.0	10.0
Kennebec	397	95	73	3	10.0	10.0
Norchip	295	89	75	3	9.1	7.6
Superior	312	95	78	4	10.0	10.0
Mean	269	89	75			
LSD (.05)	43	4	4			
(.01)	57	5	5			

^{1/} 1.0 deleted

^{2/} 1 = Poor to 5 = Excellent

^{3/} Chip color tests by Dr. R. V. Akeley.
Samples from two replicates were held at 38° F from harvest to November 17, followed by reconditioning at 70° F for two and four weeks. 1 = Light to 10 = Dark brown.

Campbell Table 9. Yield, specific gravity, tuber rating and chip color of varieties in late trial - Perham, Maine

Variety	Yield above 2"		S. G. ^{1/}	Tuber Rating ^{2/}	Chip Color ^{3/}	
	Cwt./A	%			2 Weeks	4 Weeks
BR6246- 1	339	91	60	3	10.0	9.9
BR6321- 1	357	95	67	3+	10.0	10.0
BR6617- 2	323	96	66	4	10.0	10.0
BR6848- 4	204	85	73	3+	10.0	10.0
BR6900- 2	346	94	68	3+	10.0	10.0
BR6835- 3E	236	81	75	4	10.0	10.0
BR6835- 7E	247	82	78	3+	10.0	10.0
BR6838- 5E	102	60	82	3	10.0	10.0
BR6863- 3E	215	85	74	3	10.0	9.0
BR6863-14E	289	89	79	3	9.5	8.9
BR6864- 3E	274	87	83	3	10.0	10.0
BR7049- 4	315	91	78	4	10.0	10.0
BR7066- 1	367	94	65	4	10.0	10.0
BR7072- 5	348	90	68	3	10.0	10.0
BR7079- 8	295	94	69	4	10.0	10.0
BR7088- 2	326	94	79	3+	8.7	9.5
BR7089- 1	281	95	76	4	10.0	9.5
BR7093- 5	298	96	76	3+	8.6	8.3
BR7093-14	310	97	68	3+	10.0	9.7
BR7093-23	325	91	79	3	10.0	10.0
BR7085- 1	338	93	80	3+	10.0	10.0
B 5141- 6	246	89	96	3+	9.5	7.0
B 6712-20	238	78	84	3	8.6	6.8
B 6716- 8	254	90	82	3+	10.0	10.0
Gr. Mountain	348	93	74	3	10.0	10.0
Katahdin	291	93	68	4	10.0	10.0
Kennebec	348	96	72	4	10.0	9.5
R. Burbank	282	75	76	3-	10.0	10.0
Mean	291	89	75			
LSD (.05)	48	5	4			
(.01)	64	7	5			

^{1/} 1.0 deleted

^{2/} 1 = Poor to 5 = Excellent

^{3/} Chip color tests by Dr. R. V. Akeley.
Samples from two replicates were held at 38° F from harvest to November 17, followed by reconditioning at 70° F for two and four weeks. 1 = Light to 10 = Dark brown.

Campbell Table 10. Yield, specific gravity, tuber rating and processing quality of selections and varieties grown at the Clemson Truck Crops Experiment Station, Charleston, South Carolina--1971*

Variety	Yield over 2 ⁿ		S. G. ^{1/}	Tuber Rating ^{2/}	Mash Text. ^{3/}	Chip Color ^{4/}
	Cwt./A	%				
BR5960- 5	328	85	83	4	1.0	6.7
BR5960-13	264	86	91	3	1.0	6.5
BR6316- 5	280	86	79	4	2.5	4.8
BR6316- 7	277	67	87	3	1.5	7.6
BR6442- 1	280	86	78	4+	1.5	7.7
BR6463- 1	239	78	73	3+	4.0	6.6
BR6463- 2	225	74	79	2	2.0	6.7
BR6491- 5	139	57	84	2	2.0	7.0
BR6626- 5	275	79	74	3+	3.5	8.3
BR6822- 5	275	86	74	3	3.0	6.1
BR6824- 1	250	82	79	3+	2.0	8.1
BR6831- 5	219	89	75	3+	2.0	7.8
BR6851- 2	250	91	71	4	3.0	8.4
BR6859- 3	203	78	81	3	3.0	8.3
BR6862- 2	202	86	76	4	2.0	6.0
BR6863- 2	166	80	73	4	4.0	4.7
BR6864- 3E	229	79	76	3+	2.0	6.1
Kennebec	309	81	76	2+	2.0	7.2
Norchip	267	83	81	2	1.5	5.3
Seminole	216	86	88	3	1.5	6.7
Mean	245	81	79		2.3	6.8
LSD (.05)	69	8				
(.01)	91	11				
CV - %	19.8	6.9				

^{1/} 1.0 deleted (mean of two reps.)

^{2/} 1 = Poor to 5 = Excellent

^{3/} 1 = Good to 5 = Poor

^{4/} 1 = No color to 10 = Dark brown (mean of two reps.)

*Dr. W. R. Sitterly, cooperating.

Campbell Table 11. Yield, specific gravity, tuber rating and chip color of selections and varieties for frozen product evaluation grown at Parkesley, Va.-1971

Variety	Yield over 2 ⁿ		S. G. ^{1/}	Tuber Rating ^{2/}	Chip Color ^{3/}
	Cwt./A	%			
BR5960- 5	270	85	67	3+	4.8
BR5960-13	234	86	74	2+	3.9
BR6316- 5	204	77	66	4	3.7
BR6316- 7	266	76	69	3+	4.1
BR6463- 1	174	75	67	3+	3.3
BR6463- 2	241	74	68	3+	3.8
BR6491- 5	170	69	74	3	3.5
BR6614- 1	274	92	57	3	5.9
BR6626- 5	253	75	66	2	4.7
BR6822- 5	178	76	65	3	4.1
BR6824- 1	153	72	67	3	3.8
BR6831- 5	125	80	68	4	4.2
BR6851- 2	225	87	61	2+	5.5
BR6859- 3	193	73	68	3+	4.5
BR6862- 2	195	83	62	4	4.7
Kennebec	274	74	67	3	4.6
Norchip	225	73	66	2	4.2
Norland	97	55	56	2	4.2
Pungo	297	85	66	2+	5.3
Seminole	220	87	73	3+	4.2
Superior	232	83	64	2	4.0
B 5141- 6	269	81	77	4	3.8
Mean	217	78	67		4.3
LSD (.05)	55	7	6		0.9
(.01)	74	9	8		1.2
CV - %	20.3	6.9	7.4		17.3

^{1/} 1.0 deleted

^{2/} 1 = Poor to 5 = Excellent

^{3/} 1 = No color to 10 = Dark brown.

Campbell Table 12. Yield, specific gravity and tuber rating of varieties and selections for frozen product evaluation grown at Shirley, New Jersey--1971

Variety	Yield over 2"		S. G. ^{1/}	Tuber Rating ^{2/}
	Cwt./A	Percent		
BR5960- 5	349	85	63	2
BR5960-13	312	87	69	2
BR6316- 5	289	85	67	2+
BR6316- 7	256	69	60	2
BR6463- 1	261	82	73	3
BR6463- 2	301	66	62	2
BR6491- 1	353	85	74	2
BR6491- 5	282	63	73	3
BR6614- 1	328	84	49	1+
BR6626- 5	260	61	55	2
BR6822- 5	236	76	64	2+
BR6831- 5	210	76	76	3+
BR6834- 1	290	67	48	2
BR6851- 2	306	82	63	2+
BR6859- 3	343	78	66	4
BR6862- 2	265	64	60	3
BR6863- 3	314	90	68	3+
BR6863- 7	221	65	69	3
BR6863- 1E	228	51	65	1+
BR6863-15E	218	61	71	2+
BR6864- 1	193	51	69	2
BR6864- 3E	106	33	59	2
Kennebec	270	69	55	1+
Norchip	295	72	67	2
Norland	274	64	-	4
Seminole	374	88	71	1+
Superior	312	80	62	1+
B 5141- 6	240	69	67	2+
Mean	275	72	65	
LSD (.05)	64	8	5	
(.01)	84	11	6	
CV - %	18.5	9.1	6.0	

^{1/} 1.0 deleted

^{2/} 1 = Poor to 5 = Excellent

Campbell Table 13. Yield, specific gravity and tuber rating of varieties and selections for frozen product evaluation grown at Ebensburg, Penna.--1971

Variety	Yield over 2"		S. G. ^{1/}	Tuber Rating ^{2/}
	Cwt./A	Percent		
BR5960- 5	304	94	77	2+
BR5960-13	424	96	75	4+
BR6316- 5	383	95	80	3
BR6316- 7	394	93	84	3
BR6463- 1	227	89	70	3+
BR6463- 2	336	90	75	4
BR6491- 1	226	92	89	2+
BR6491- 5	209	86	83	4
BR6614- 1	316	96	73	3
BR6626- 5	401	93	78	4
BR6824- 1	240	88	71	3
BR6831- 5	191	92	72	3+
BR6834- 1	402	95	62	3
BR6851- 2	273	92	72	2
BR6859- 3	234	90	81	3
BR6863- 2	68	65	70	4+
BR6863- 3	266	96	75	4
BR6863- 4	292	95	79	2
BR6863- 7	260	85	78	3
Kennebec	481	95	75	3+
Norchip	345	92	74	3
Norland	233	90	62	2
Raritan	430	94	88	3+
R. Burbank	413	93	83	2+
Superior	342	96	73	4
B 5141- 6	292	93	92	3+
Mean	307	91	77	
LSD (.05)	78	6	5	
(.01)	103	8	6	
CV - %	20.4	5.1	5.1	

^{1/} 1.0 deleted

^{2/} 1 = Poor to 5 = Excellent

Campbell Table 14. Yield, specific gravity and tuber rating of varieties and selections for frozen product evaluation on grown at Perham, Maine--1971

Variety	Yield in Cwt./acre		Percent Yield			S. G.	Tuber 2/ Rating	Chip Color	
	Above 2"	Above 2.5"	2-2.5"	2.5-3"	Over 3"			2 Weeks	4 Weeks
BR5960-5	339	221	33	45	15	82	3	10.0	7.8
BR5960-13	304	145	49	39	4	80	3+	10.9	9.5
BR6316-5	369	203	43	45	6	75	4	10.0	8.2
BR6316-7	347	124	56	31	0	73	3	9.3	10.0
BR6463-1	249	74	62	27	0	77	4	10.0	10.0
BR6463-2	341	212	35	47	10	77	3+	10.0	8.4
BR6491-1	240	107	52	40	1	88	4	9.5	7.4
BR6491-5	264	37	70	11	0	88	3	8.1	8.2
BR6614-1	278	225	19	37	41	69	3	10.0	9.7
BR6626-5	403	282	28	50	16	73	3+	10.0	9.5
BR6824-1	259	106	52	36	0	79	3	9.0	6.6
BR6831-5	284	199	28	52	14	79	4+	10.0	10.0
BR6834-1	364	178	45	40	3	63	3+	10.0	10.0
BR6851-2	340	212	35	43	14	77	4	10.0	10.0
BR6859-3	215	73	57	28	0	79	4	10.0	9.4
BR6863-2	239	165	30	47	18	78	3	7.2	5.8
BR6863-3	266	164	37	46	11	83	4	8.4	7.6
BR6863-4	288	147	44	44	3	74	3+	9.0	6.3
BR6863-7	338	213	29	46	12	82	3+	10.0	9.1
BR6835-2E	193	12	59	4	0	83	3	9.5	9.3
BR6838-6E	183	46	57	18	1	72	2	10.0	10.0
BR6850-13E	388	224	39	46	7	73	3+	10.0	10.0
BR6863-1E	381	203	42	42	6	87	3	8.1	7.0
BR6863-15E	233	44	64	14	0	89	3+	6.8	5.1
B 6516-4	261	71	62	23	0	88	4+	8.1	6.5
B 6705-15	328	70	68	18	0	75	4	10.0	10.0
Gr. Mountain	397	193	47	42	2	77	2+	10.0	10.0
Kennebec	388	247	33	49	11	73	3+	9.5	9.4
Norland	339	172	45	41	6	69	4	10.0	8.7

Campbell Table 14. (Continued)

Variety	Yield in Cwt./acre		Percent Yield			S. G.	Tuber 2/ Rating	Chip Color	
	Above 2"	Above 2.5"	2-2.5"	2.5-3"	Over 3"			2 Weeks	4 Weeks
R. Burbank	323	62	67	15	0	74	2	10.0	9.6
Seminole	247	165	32	56	6	89	3	8.5	7.3
Superior	338	172	46	43	4	77	3+	10.0	10.0
Mean	304	149	46	36	7	78			
ISD (.05)	40	42	9	8	7	4			
(.01)	53	55	12	11	9	6			
CV - %	10.5	21.5	15.4	17.8	83.9	4.6			

1/ 1.0 deleted

2/ 1 = Poor to 5 = Excellent

3/ Chip color tests by Dr. R. V. Akeley

Samples from two replicates were held at 38° F from harvest to November 17, followed by reconditioning at 70° F for two and four weeks. 1 = Light to 10 = Dark brown.

Campbell Table 15. Yield, specific gravity and tuber rating of varieties and selections for frozen product evaluation grown at Perham, Maine--1971

Variety	Yield in Cwt./acre		Percent Yield			S. G.	Tuber 2/ Rating	Chip Color ^{3/}	
	Above 2"	Above 2.5"	2-2.5"	2.5-3"	Over 3"			2 Weeks	4 Weeks
BR7044- 2	325	111	58	29	2	78	3+	10.0	10.0
BR7046- 1	295	213	27	50	19	82	2+	10.0	9.1
BR7049- 2	384	275	27	45	22	79	3	9.0	8.6
BR7056- 4	362	171	50	37	4	68	4	10.0	10.0
BR7062- 4	265	35	68	11	0	85	3+	9.0	9.3
BR7074- 4	316	122	56	33	2	73	3+	10.0	10.0
BR7075- 9	323	88	62	21	2	73	3	10.0	9.4
BR7076- 3	384	180	49	37	5	69	3+	10.0	10.0
BR7082- 6	358	108	63	27	0	71	4	10.0	10.0
BR7083- 1	261	44	68	13	1	88	3+	10.0	9.9
BR7083- 3	263	38	68	11	0	83	4	9.4	7.3
BR7085- 1	318	106	59	26	3	80	4	10.0	10.0
BR7093- 4	413	254	37	44	14	77	3	10.0	9.9
BR7093- 6	343	181	43	36	13	79	3+	10.0	9.5
BR7093- 9	310	232	24	54	19	76	3+	10.0	8.5
BR7093-12	267	132	47	44	3	81	3	7.0	6.8
BR7093-20	301	184	37	45	10	81	3	8.1	7.3
BR7093-22	315	166	43	44	5	86	4	7.0	6.2
BR7096- 1	347	275	20	51	27	83	4	9.6	9.0
BR7099- 7	247	72	59	23	1	74	3+	10.0	9.4
BR7101- 2	295	117	52	32	3	-	3+	9.4	10.0
BR7102- 4	376	198	43	37	10	76	4+	10.0	9.9
BR7103- 1	408	272	26	50	12	77	3+	10.0	9.3
BR7103- 7	361	254	29	47	20	82	3	9.6	8.5
BR7105-10	345	142	44	37	5	72	4+	9.0	9.0
BR7108- 1	358	171	48	34	10	79	3+	10.0	9.9
BR7108- 3	339	120	57	26	5	83	3	10.0	8.3
B 5141- 6	325	114	61	30	2	95	4+	9.5	7.1
Kennebec	390	251	33	42	18	72	3+	9.4	10.0
Norchip	365	144	53	33	2	79	3	9.0	8.2
Raritan	379	260	29	46	18	88	4	10.0	10.0
R. Burbank	339	36	68	8	0	78	2	10.0	10.0

Campbell Table 15. (Continued)

Variety	Yield in Cwt./acre		Percent Yield		S. G. ^{1/}	Tuber 2/ Rating	Chip Color ^{3/}	
	Above 2"	Above 2.5"	2-2.5"	2.5-3"			2 Weeks	4 Weeks
Mean	334	158	47	35	8	79		
LSD (.05)	41	42	10	9	7	3		
(.01)	54	55	13	12	9	5		
CV - %	9.8	21.2	16.1	21.1	65.0	3.5		

^{1/} 1.0 deleted

^{2/} 1 = Poor to 5 = Excellent

^{3/} Chip color tests by Dr. R. V. Akeley
Samples from two replicates were held at 38° F from harvest to November 17, followed by reconditioning at 70° F for two and four weeks. 1 = Light to 10 = Dark brown.

Campbell Table 16. Yield, specific gravity, tuber rating and chip color of USDA selections and varieties for frozen product evaluation grown at Perham, Maine--1971

Variety	Yield above 2"		S. G. ^{1/}	Tuber ^{2/} Rating	Chip Color	
	Cwt./A	%			2 Weeks	4 Weeks
B6495-12	295	83	77	3	10.0	10.0
B6495-20	358	92	92	3+	10.0	9.0
B6516- 5	264	91	84	4	7.8	5.6
B6532- 3	256	80	97	3+	10.0	9.7
B6532- 4	329	92	82	3+	10.0	9.7
B6532-10	260	76	92	3	8.2	8.3
B6532-14	209	61	89	4	8.9	8.7
B6692- 1	307	93	81	3	9.9	10.0
B6692- 5	373	94	75	3+	10.0	10.0
B6692-27	344	91	77	4	10.0	10.0
B6712-17	325	96	81	3+	9.5	8.0
B6712-18	220	89	76	3+	9.5	9.2
B6739- 2	295	90	82	3	10.0	9.8
B6936-16	234	90	89	4	9.5	6.6
B6936-26	256	92	84	4	9.0	8.5
B6955-14	337	92	81	3+	10.0	9.7
B6987-25	248	93	88	3+	8.3	7.3
Kennebec	361	96	73	3	9.8	8.5
R. Burbank	275	77	77	2+	10.0	10.0
B5141- 6	190	87	93	4	8.4	7.2
Mean	287	88	83			
LSD (.05)	49	4	3			
(.01)	65	6	4			
CV - %	13.6	4.0	3.0			

^{1/} 1.0 deleted

^{2/} 1 = Poor to 5 = Excellent

^{3/} Chip color tests by Dr. R. V. Akeley.
Samples from two replicates were held at 38° F from harvest to November 17, followed by reconditioning at 70° F for two and four weeks. 1 = Light to 10 = Dark brown.

NEW JERSEY

G. D. Lewis

Potato Variety Trials

Two potato trials were conducted at the Vegetable Research Farm at New Brunswick. The first was a comparison of 18 numbered lines and named varieties in a 4-replication trial. The second was an unreplicated trial of 7 additional lines for which a limited amount of seed was available. Each plot was 3' x 20' and was hand-planted with 25 seedpieces spaced at 10" in the row. The fertilizer used was a banded application of 10-20-10 at the rate of 1900 lb/acre. The plots were planted on April 12, the vines were rotobated on September 23, and the field was harvested on October 8.

The early part of the season was cold and wet and frequent, heavy rainfall was experienced in August and September.

Table 1. Replicated Trial - Yields and Tuber Ratings.

Variety	Yield cwt/acre		Percent over 2"	Percent B Size	Tuber rating ^{1/}	Remarks
	US #1's over 2"	Total				
BR6312-2	502 A	664	75.6	5.7	1.0	Very knobby
B6595-5	483 A	535	90.2	8.0	5.0	
B6698-19	326 B	401	81.2	8.7	4.0	
B6044-14	319 B	409	78.0	5.4	2.9	
Superior	317 BC	346	91.6	3.8	4.5	
BR5965-3	310 BCD	363	85.4	9.3	1.5	Knobby
B6705-10	309 BCD	343	90.0	6.3	4.4	
BR5946-9	303 BCDE	319	95.0	4.4	4.5	
Peconic	293 BCDE	319	91.8	7.2	4.0	
BR6316-7	290 BCDE	355	81.8	7.2	1.8	
6HS9 (Pa.)	284 BCDE	312	90.9	7.0	3.3	Knobby
Raritan	273 BCDE	340	80.2	9.9	3.8	
Abnaki	242 BCDE	311	77.8	4.7	3.8	
B6567-12	227 BCDE	278	81.7	5.4	3.5	
B6782-1	224 BCDE	292	76.6	18.3	1.3	
Green Mt.	213 CDE	319	66.7	11.7	1.5	Knobby
B6799-5	210 DE	320	65.5	12.6	1.5	Knobby
B6337-4	204 E	278	73.4	7.4	2.6	Knobby

^{1/} 1 = poor, 5 = excellent

Table 2. Replicated trial - Specific Gravity and U.S. #1's over 2".

Variety	Specific Gravity	Yield cwt/acre U.S. #1's over 2"
Raritan	1.0677 A	273
B6044-14	1.0643 B	319
Green Mtn.	1.0622 BC	213
B6595-5	1.0619 BC	483
Peconic	1.0598 BCD	293
BR6316-7	1.0592 BCDE	290
Abnaki	1.0578 DEF	242
B6567-12	1.0564 DEF	227
BR5946-9	1.0555 DEF	303
6HS9 (Pa.)	1.0554 DEF	284
BR5965-3	1.0550 DEF	310
B6799-5	1.0543 EF	210
B6698-19	1.0539 F	326
B6337-4	1.0538 F	204
Superior	1.0534 F	317
B6705-10	1.0490 G	309
B6782-1	1.0466 G	224
BR6312-2	1.0403 H	502

Table 3. Unreplicated Trial - Yields, Specific Gravity, and Tuber Ratings

Variety	Yield cwt/acre US#1's over 2"		Percent over 2"	Percent B Size	Specific Gravity	Tuber rat- ing ^{1/}	Remarks
B6503-5	316	399	79	5	1.0549	4	Knobby
BR6448-7	170	232	72	6	1.0462	3	
B6562-22	134	204	66	5	1.0491	1.5	
BR6315-4	232	250	93	6	1.0456	4	
B6581-15	221	266	83	7	1.0428	i	
B6138-3	334	385	87	11	1.0641	3	Knobby
BR5967-7	243	264	92	5	1.0634	4	

^{1/} 1 = poor, 5 = excellent

Elizabeth F. Stier

Quality Evaluation Report on Potatoes

Twenty-five samples of New Jersey grown potatoes were submitted to the Food Science Department for quality evaluation. Potatoes were baked, boiled and made into chips. The samples had been harvested earlier in the fall and properly stored by the Plant Biology Department at recommended storage temperatures. To ensure proper conditioning potatoes were removed from storage December 15 and held at room temperature nearly four weeks prior to making them into chips.

Baked samples were baked at 400° F for one hour. Four tubers from each lot were baked to ensure a representative sample. Color was assessed by two trained observers using the USDA color chart. Flavor and texture were also rated by experienced judges.

The boiled samples were cooked in regular saucepans after being peeled until done. Four tubers comprised a sample. Sloughing was evaluated by comparing with the USDA sloughing chart where 3 = none, 2 = moderate, 1 = extreme. Color was assessed by comparison with the USDA color chart which had 3 = creamy white, 2y = slightly yellow, 1y = yellow, 2g = slightly gray and 1g = grey. Flavor and texture were evaluated by two experienced judges.

Chips were prepared by the following procedure. Four representative tubers were washed, peeled, cut into 1/8" slices using a Hobart slicer, rinsed in running water to remove excess starch and dried thoroughly on paper toweling prior to frying. Chips were fried in corn oil at 375° F until bubbling ceased. Chips were evaluated for color using American Potato Chip Institute Charts. Flavor and texture were evaluated by experienced judges. The attached table summarizes the results on all samples.

Baked potato texture was characterized as mealy, soggy or sodden. The term sodden means really, really wet. Flavor if good potato flavor was characterized as good. Fair meant not such a good flavor, but no disagreeable overtones. Earthy meant that this was the predominant note.

Boiled potatoes had, in addition to these terms, astringent and alkaline or baking soda used as additional terms. In the textural notations wet meant even more watery than sodden.

The textural notations on chips are explained as follows: good - crisp and pleasant, greasy - not crisp and the oil predominated. Flavor was categorized as good when chip flavor was pleasing. The other major descriptive term was bitter, which usually was associated with dark colored chips.

On an overall basis the potatoes this year were of poor quality than normal. Whether or not this is associated with the weather of the past summer is an open question. Certainly there is no comparison with the relatively high quality potatoes grown in 1970. Only four samples of chips were really of acceptable color. Most were in the unacceptable category.

New Jersey Table 1. Quality Evaluation of Potatoes. January 5, 6, 10, 11, 1972.

Variety	Baked			Potato Chips			Boiled			Sloughing
	Color	Flavor	Texture	Color	Flavor	Texture	Color	Flavor	Texture	
BR6315-4	3 cw	bland	soggy	10	bitter-poor	greasy & not crisp	2y	good	soggy	3
B6581-15	3 cw	earthy	good-mealy	5-6	bitter	greasy & not crisp	2y	earthy	sodden	3
B6503-5	3 cw	bland	soggy	4	good	good - crisp	2y	astrigent	firm	3
6HS9	2y	earthy	soggy	7-8	bitter	good - crisp	2y	earthy	soggy	3
BR6448-7	3 cw	good	mealy	5-6	good	greasy & not crisp	3	astrigent	sodden	3
Green Mt.	2y	good	mealy	9-10	good	good - crisp	ly	astrigent	sodden	2
Raritan	2y	good	mealy	6	good	good	2y	bland	mealy	3
Abnaki	ly	good	soggy	9	bitter	very crisp	2g	bitter	soggy	3
B6698-19	2y	good	soggy	5-6	good	good	2y	earthy	soggy	1
B6705-10	2y	earthy	soggy	8	fair	greasy & not crisp	2g	bitter	sodden	3
B6044-14	ly	earthy	soggy	7	bitter	slightly greasy	2y	earthy	mealy	3
BR5946-9	3 cw	good	sodden	5	good	very greasy	2g	earthy	soggy	3
B6562-22	ly	bland	soggy	7-8	good	good	2y	fair	wet	3
BR5965-3	2y	fair	mealy	9-10	bitter	good	2y	earthy	mealy	3
B6595-5	2y	fair	soggy	4	good	slightly crisp	ly	good	soggy	3
B6138-3	2y	good	mealy	4-5	good	greasy	2y	good	mealy	3
B6337-4	3 cw	good	wet-sticky	10	very bitter	good	2y	poor	wet	3
B6799-5	2y	poor	sodden	10	very bitter	greasy	2y	good	soggy	3
BR6316-7	2g	good	soggy	4-5	good	good	ly	poor	soggy	3
B6782-1	2y	poor	sodden	10	bitter	greasy	3cw	v.poor-earthy	soggy	3
BR6312-2	3 cw	poor-earthy	v.sodden	10	bitter	good	2y	bland	soggy	2
Peconic	ly	bland	soggy	3-4	good	good	2y	earthy-smokey	sl.soggy	3
B6567-12	2y	good	mealy	10	bitter	good	3cw	good	mealy	3
BR5967-7	ly	good	soggy	6-7	good	good	2y	fair	sl. wet	3
Superior	2y	poor	sodden	9-10	bitter	good	2y	alkaline-baking	soggy	3

NEW YORK

R. C. Cetas

Evaluation of Potato Varieties and Breeding Lines for Scab
and Verticillium Wilt Resistance on Long Island in 1971

Scab. Thirty-four varieties and breeding lines of potatoes were evaluated for scab resistance in soils that were naturally infested with Streptomyces scabies at the Long Island Vegetable Research Farm, Riverhead, New York in 1971. The pH of the light Sassafras loam soil was 5.7 to 5.8 when determined in CaCl_2 and 6.3 to 6.7 when determined in H_2O in March 1970. The seedpieces were cut and treated with eight percent active Dithane M-45 dust on March 26, 1971. Two replicates of 10 hills of each variety and breeding line were planted by hand on April 23. Each plot was paired with one of the Chippewa variety, which was planted by machine. The hand-planted seedpieces were spaced 12 inches apart in the row and the machine-planted ones nine inches apart. All rows were 34 inches apart. The 8-16-8 grade fertilizer was applied at the rate of 2250 pounds per acre as the rows were marked with the two-row potato planter on April 23. Foliar diseases and insects were controlled with weekly sprays of Dithane M-45, Guthion, and Meta-Systox-R. The plants were killed with a recommended dosage of Dow General on September 9, and the tubers were harvested on September 20.

Forty tubers, or all tubers if less than 40 were available, from each plot were washed and examined for scab lesions. Each tuber was scored 0 (no lesions) to four (deep pits) for type of scab present, and 0 (no lesions) to five (61% or more) for surface area covered by scab lesions. These values were converted to individual tuber indices that ranged from 0 (no scab) to 140 (61% or more of the surface area covered by deep pitted scab). The scab index for each plot was calculated by dividing the sum of the individual tuber indices by the number of tubers examined. The index for each variety or breeding line was determined by calculating the average of the two plots. A comparative index was calculated for each variety or breeding line by dividing the varietal or breeding line index by the average index for the paired Chippewa plots and multiplying the quotient by 100. These values (Table 1) allows one to see at a glance which varieties and breeding lines were more or less resistant to scab than Chippewa, and to make comparisons among varieties and/or breeding lines.

The results of the 1971 test suggest that Norchip, Wauseon, NY-49, NY-51, Fl2-61, F293-10, H413-5, and J99-5 were highly resistant to scab. Other varieties and breeding lines that appeared to be more resistant to scab than Katahdin were NY-48, F9-31, H162-3, H213-7, H394-5, and J62-6. Varieties and breeding lines that were as susceptible or nearly so to scab as Katahdin were Abnaki, Peconic, Seminole, B6376-6, NY-6, NY-30, NY-41, H93-3, H474-4, and J157-2. The other varieties and breeding lines included in this test were as or more susceptible to scab than Chippewa.

New York Table 1. Results obtained by growing various varieties and breeding lines of potatoes in soils that were naturally infested with Streptomyces scabies on Long Island in 1971.

Variety or line	Scab index			Average scab lesion type ^{2/}		Percentage of tubers with scab	
	Line	Chipp- ewa	Compar- itive ^{1/}	Line	Chippewa	Line	Chippewa
Abnaki	4.5	13.4	34	2.5	3.0	45	70
Katahdin	13.2	26.6	50	2.4	3.4	82	71
Norchip	1.0	16.2	6	2.2	2.9	24	76
Peconic	4.8	16.9	28	2.0	3.0	61	78
Raritan	47.0	35.1	134	2.9	3.1	94	92
Wauseon	0.4	17.8	2	2.3	3.2	8	75
Oromonte	54.4	21.1	258	4.0	2.9	96	85
Seminole	9.2	37.1	25	2.1	3.2	36	80
B6376-6	15.8	20.2	78	2.5	3.2	70	66
NY-6	8.4	22.2	38	2.2	3.1	62	71
NY-30	8.8	26.6	33	2.5	3.2	66	81
NY-41	12.8	24.2	53	2.5	3.3	88	68
NY-45	27.2	30.2	90	2.9	3.3	98	84
NY-46	46.4	27.4	169	3.3	3.4	98	88
NY-47	62.5	20.7	302	3.7	2.9	89	82
NY-48	2.7	15.4	18	2.1	3.0	32	78
NY-49	1.5	21.5	7	2.0	3.2	39	78
NY-50	24.8	14.8	168	3.8	2.9	86	78
NY-51	2.4	30.0	8	2.2	3.0	24	80
NY-52	28.8	13.8	209	3.6	3.2	86	79
F9-31	2.1	15.2	14	2.0	2.7	45	68
F12-61	1.2	24.4	5	2.0	3.4	21	70
F293-10	1.2	20.6	6	2.0	3.1	35	67
H93-2	16.1	12.0	133	2.4	2.7	90	85
H93-3	11.1	26.6	42	2.6	3.3	62	74
H162-3	3.2	22.7	14	2.8	3.4	39	65
H213-7	2.6	16.8	15	2.0	3.0	71	84
H394-5	6.6	29.8	22	2.4	3.1	68	78
H413-5	0.8	30.8	3	2.0	3.3	18	82
H474-4	5.0	15.4	32	2.2	2.9	58	71
J62-6	2.8	23.2	12	2.1	3.2	46	84
J99-5	1.4	24.6	6	2.0	2.9	34	85
J153-4	33.8	24.4	139	3.2	3.2	94	84
J157-2	9.3	13.0	72	2.4	2.8	90	75

^{1/} Comparative index = Line index ÷ Chippewa index X 100.

^{2/} Average type of scab lesion found on affected tubers.

Verticillium wilt. In 1971, 742 breeding lines were evaluated for Verticillium wilt resistance in two-hill nonreplicated plots and 174 in five-hill nonreplicated plots. Thirty-three varieties and advanced breeding lines were evaluated in 20-hill nonreplicated plots and 31 in 20-hill replicated plots. The seedpieces were cut and treated with eight percent active Dithane M-45 dust between March 26 and April 5, and were planted by hand on April 12 and 13. The seedpieces were spaced 12 inches apart in the row and the rows were 34 inches apart. The light Sassafras loam soil was naturally infested with Verticillium dahliae, Pratylenchus penetrans and other organisms that may be associated with Verticillium wilt on Long Island. All cultural practices were those employed by the grower-cooperator in whose potato field these tests were conducted.

Observations on plant growth and vine condition were made periodically during the growing season. On August 9, the breeding lines and named varieties were rated 1 to 7 for vine condition. The system used was as follows: 1 - plants normal or nearly so, 2 - slight bronzing and wilting of the foliage, 3 - 60 to 90 percent of the foliage green, 4 - 40 to 60 percent of the foliage green, 5 - 20 to 40 percent of the foliage green, 6 - trace to 20 percent of the foliage green, and 7 - all plants dead. All selections and varieties with a vine score of five or less were considered to possess resistance to Verticillium wilt.

The breeding lines and varieties in the five-hill, and the 20-hill plots were harvested on September 22. All tubers harvested were counted, weighed, and sized on a grader equipped with a two-inch chain. All size A tubers (tubers that passed over the two-inch grader chain) were washed and examined for growth cracks and knobs. Forty size A tubers, or all size A tubers if less than 40 were available, from each plot were examined for pinkeye, stemend vascular browning, hollow heart and internal necrosis. Pinkeye was scored as follows: 0 - none, 1 - lesions confined to the eyes, 2 - lesions extended beyond the eyebrows but not coalesced, 3 - lesions coalesced at apical end of tuber and/or secondary rot initiated, and 4 - lesions from apical eyes coalesced with those lower on the tuber and/or secondary rot progressed into flesh of the tuber. Stemend vascular browning was scored in a cross-sectional plane 1/8 to 1/4 inch above the stolon attachment. The scoring system used was as follows: 0 - none, 1 - trace of brown, 2 - 1 to 6 percent of the vascular ring brown, 3 - 6 to 12 percent of the vascular ring brown, 4 - 12 to 25 percent of the vascular ring brown, 5 - 25 to 50 percent of the vascular ring brown, and 6 - 50 percent or more of the vascular ring brown. The pink-eye and stemend vascular browning scores for each breeding line or variety were obtained by dividing the sum of the individual tuber scores by the number of affected tubers. A potato hydrometer was used to determine specific gravity of an eight-pound sample of tubers from each plot.

The stand count, vine score, and yield data from the replicated variety trial were subjected to the analysis of variance. Percentages were converted to equivalent angles and the transformed data were analyzed. Duncan's multiple range test was used to determine significant differences among means at the five percent level.

The first symptoms of Verticillium wilt were observed about mid-July. The very susceptible varieties and breeding lines were dead on or before August 9. Yields, in general, were considerably lower in 1971 than in 1970. For example, the average yield of size A tubers for the Katahdin variety was 258 cwt per acre in 1970 and 196 cwt per acre in 1971. Also, the environmental conditions appeared to be more favorable for the development of various defects, such as hollow heart, growth cracks and knobs, in 1971 than in 1970.

The vine scores (New York Table 2) of the varieties and breeding lines included in the replicated variety trial suggest that Abnaki, Cariboo, Oromonte, NY-6, NY-46, NY-47, NY-49, NY-52, F12-61, F21-14, H394-5, and H474-4 were more resistant to Verticillium wilt than Katahdin, and that Peconic, Raritan, B6376-3, NY-41, NY-45, NY-51, F9-31, G94-12, G573-1, and H413-5 were as resistant as Katahdin. However, only Abnaki, NY-6 and NY-51 produced 300 or more cwt of tubers per acre. Other varieties and breeding lines that produced yields equal to or better than Katahdin were Peconic, B6376-6, NY-47, NY-49, NY-50, F9-31, F12-61, G94-12, H394-5, H413-5, H162-3, and H474-4. Although 15 of the varieties and breeding lines in the replicated trial yielded as well as or better than Katahdin, several had one or more undesirable horticultural characteristics (New York Table 3).

Thirteen of the 31 breeding lines that were included in the 20-hill nonreplicated trial produced 200 or more cwt of size A tubers per acre (New York Table 4). These were Cascade, F293-10, G92-6, H413-2, J99-5, J107-12, J249-17, B5267-2, B6138-3, B6567-12, B6595-5, B6603-6, and BR6316-4. Eleven of the high yielding selections had a vine score of 5 or less on August 9. Thirty-three of the 174 breeding lines included in the five-hill nonreplicated trial produced 6.5 pounds (approximately 200 cwt/A) or more of size A tubers per plot, but many of these lines had one or more undesirable horticultural characteristics. Approximately 315 (42 percent) of the 742 lines included in the two-hill nonreplicated plots had a vine score of 5 or less on August 9.

This work was conducted in cooperation with Dr. R. E. Webb, United States Department of Agriculture, Agricultural Research Service. Crops Research Division, Beltsville, Maryland; Dr. H. D. Thurston and Dr. R. L. Plaisted, Departments of Plant Pathology and Plant Breeding, respectively, Cornell University, Ithaca, New York; and Mr. Austin Warner & Son, Riverhead, New York.

New York Table 2. Percent stand, vine score, and yield of various varieties of potatoes grown on Long Island in soils that were naturally infested with the organisms associated with Verticillium wilt in 1971 (4 replicates, 20 hills, 12-inch spacing).

Variety	Percent stand 5/26	Vine score 8/9	Yield per acre			No. of tubers/hill	
			Total GWT	2-inch GWT	minimum Percent	Total	2-inch minimum
Abnaki (1)	94 ^{cd}	4.5 ^{d-g}	345 ^k	314 ^{mn}	83 ^{k-n}	7.2 ^{i-jk}	6.0 ^k
Cariboo	100 ^d	4.2 ^{def}	198 ^{c-g}	140 ^{bcd}	58 ^{bc}	6.3 ^{f-j}	3.6 ^{c-f}
Peconic	99 ^d	5.2 ^{f-j}	272 ^{g-k}	234 ^{g-l}	76 ^{g-k}	6.7 ^{h-k}	5.1 ^{g-k}
Katahdin	95 ^{cd}	5.2 ^{f-j}	224 ^{c-i}	196 ^{c-j}	77 ^{g-l}	5.4 ^{c-h}	4.2 ^{d-g}
Alamo	82 ^a	7.0 ^l	108 ^{ab}	82 ^{ab}	66 ^{c-f}	3.4 ^{ab}	2.2 ^{ab}
Norchip	88 ^{abc}	6.0 ^{i-l}	236 ^{c-j}	183 ^{c-h}	64 ^{cde}	7.5 ^{jk}	4.8 ^{f-k}
Oromonte	94 ^{cd}	2.8 ^{bc}	189 ^{c-f}	129 ^{bc}	52 ^b	6.4 ^{h-k}	3.3 ^{b-e}
Raritan	95 ^{cd}	4.8 ^{e-h}	169 ^{bc}	140 ^{bcd}	72 ^{d-h}	4.1 ^{a-d}	3.0 ^{bc}
Seminole	98 ^d	6.5 ^{kl}	206 ^{c-h}	185 ^{c-i}	84 ^{k-n}	4.6 ^{a-f}	3.8 ^{c-g}
NY-6	100 ^d	4.2 ^{def}	346 ^k	302 ^{k-n}	73 ^{e-i}	8.0 ^k	6.0 ^k
B6376-6	84 ^a	5.5 ^{g-k}	288 ^{ijk}	264 ^{j-n}	85 ^{lmn}	7.0 ^{h-k}	5.8 ^{jk}
NY-41	85 ^{ab}	5.5 ^{g-k}	196 ^{c-f}	180 ^{c-h}	82 ^{j-n}	4.6 ^{a-f}	3.8 ^{c-f}
NY-45	94 ^{cd}	5.2 ^{f-j}	173 ^{bcd}	148 ^{cde}	74 ^{f-j}	4.4 ^{a-e}	3.2 ^{b-e}
NY-46	99 ^d	3.0 ^c	206 ^{c-h}	164 ^{c-g}	71 ^{d-h}	5.9 ^{e-j}	4.2 ^{d-g}
NY-47	99 ^d	1.5 ^a	299 ^{jk}	239 ^{h-m}	64 ^{cd}	8.0 ^k	5.1 ^{g-k}
NY-48	98 ^d	5.8 ^{h-k}	226 ^{c-j}	198 ^{d-j}	79 ^{h-m}	5.8 ^{e-i}	4.5 ^{f-j}
NY-49	95 ^{cd}	3.8 ^{cde}	292 ^{ijk}	258 ⁱ⁻ⁿ	77 ^{g-l}	6.4 ^{g-k}	4.9 ^{f-k}
NY-50	98 ^d	6.0 ^{i-l}	236 ^{c-j}	217 ^{e-j}	87 ⁿ	4.8 ^{b-g}	4.2 ^{c-g}

(New York Table 2 continued next page)

New York Table 2 (Concluded).

Variety ^{1/}	Percent stand 5/26	Vine score 8/9	Yield per acre		No. of tubers/hill	
			Total CWT	2-inch minimum 2/ CWT	Total	2-inch minimum
				Percent		
NY-51	100 ^d	5.5 ^{g-k}	344 ^k	308 ^{lmn}	7.0 ^{h-k}	5.6 ^{h-k}
NY-52	99 ^d	4.2 ^{def}	170 ^{bc}	140 ^{bcd}	4.3 ^{a-e}	3.1 ^{bcd}
F9-31	96 ^d	5.5 ^{g-k}	256 ^{f-j}	229 ^{f-k}	6.3 ^{g-k}	5.1 ^{g-k}
F12-61	96 ^d	4.2 ^{def}	230 ^{c-j}	197 ^{d-j}	5.5 ^{c-h}	4.1 ^{c-g}
F21-114	96 ^d	4.2 ^{def}	210 ^{c-h}	169 ^{c-h}	5.5 ^{c-h}	3.8 ^{c-f}
H394-5	98 ^d	1.8 ^{ab}	282 ^{h-k}	240 ^{h-m}	6.5 ^{h-k}	4.6 ^{f-j}
H413-5	98 ^d	5.0 ^{f-i}	235 ^{c-j}	209 ^{d-j}	5.6 ^{d-i}	4.2 ^{c-g}
G94-12	100 ^d	5.2 ^{f-j}	250 ^{e-j}	212 ^{e-j}	5.9 ^{e-j}	4.4 ^{e-i}
G573-1	98 ^d	4.8 ^{e-h}	91 ^a	56 ^a	3.4 ^a	1.6 ^a
G694-15	98 ^d	6.2 ^{jk1}	216 ^{c-i}	182 ^{c-h}	5.6 ^{d-i}	4.2 ^{d-g}
HL62-3	92 ^{bcd}	6.5 ^{kl}	244 ^{d-j}	213 ^{e-j}	6.0 ^{f-j}	4.7 ^{f-k}
H93-3	95 ^d	6.0 ⁱ⁻¹	181 ^{cde}	161 ^{c-f}	4.0 ^{abc}	3.1 ^{bcd}
HL74-4	99 ^d	4.2 ^{def}	235 ^{c-j}	199 ^{d-j}	5.9 ^{e-j}	4.2 ^{d-h}
Abnaki (2)	100 ^d	3.5 ^{cd}	341 ^k	317 ⁿ	6.7 ^{h-k}	5.6 ^{ijk}

^{1/} The sources of the seed potatoes were as follows: Alamo, Oromonte, Raritan, and Seminole - Maine Seed Board; Norchip - Maine Certified Seed; Abnaki (2) and B6376-6 - USDA, Crops Research Division, Beltsville, Maryland; all others - Cornell University, Ithaca, New York.

^{2/} Based on number of tubers.

New York Table 3. Specific gravity and percentage of tubers with various defects when grown in soils that were naturally infested with organisms associated with Verticillium wilt on Long Island in 1971 (4 replicates, 20 hills, 12-inch spacing).

Variety ^{1/}	Specific ^{2/} gravity	Stem end			Internal necrosis	Hollow heart	Growth cracks	Knobs	
		Pink eye ^{3/} %	browning %	Score ^{3/}					
Abnaki (1)	62	0.0	0.0	29	1.3	0.0	3.1	1.3	9.4
Cariboo	74	0.0	0.0	86	3.0	0.6	0.0	0.0	18.8
Peconic	70	1.9	1.7	58	2.1	0.0	1.2	0.5	0.5
Katahdin	<60	3.8	1.0	64	2.7	0.0	1.9	0.3	0.6
Alamo	<60	26.5	2.3	81	2.4	0.8	0.8	4.2	5.8
Norchip	72	0.0	0.0	52	1.4	0.6	0.0	1.2	2.1
Oromonte	70	0.6	1.0	36	2.0	3.1	0.6	0.4	23.4
Raritan	74	12.8	2.5	77	2.6	2.0	30.2	1.4	13.4
Seminole	72	1.2	3.5	60	1.5	0.0	18.1	0.0	5.7
NY-6	62	0.6	1.0	62	2.3	0.0	1.9	2.8	3.4
B6376-6	65	1.9	1.0	26	1.4	0.0	0.0	1.4	0.0
NY-41	60	9.7	1.0	53	1.6	0.6	3.9	4.3	0.4
NY-45	66	0.6	1.0	33	1.4	0.0	5.0	1.3	0.0
NY-46	68	0.6	1.0	29	1.6	1.2	0.6	0.3	1.5
NY-47	72	0.0	0.0	39	1.9	8.1	0.6	2.7	3.5
NY-48	60	4.4	2.3	80	2.0	3.1	1.2	2.2	2.0
NY-49	65	0.0	0.0	35	1.4	2.5	0.0	1.6	27.7
NY-50	<60	4.4	1.6	43	1.7	0.0	0.6	2.4	1.2

(New York Table 3 continued on next page)

New York Table 3 (Concluded).

Variety ^{1/}	Specific gravity ^{2/}	Stemend			Internal necrosis	Hollow heart	Growth cracks	Knobs
		Pinkeye %	Score ^{3/}	browning %				
NY-51	<60	1.2	3.5	74	4.4	7.5	1.1	2.0
NY-52	<60	0.6	3.0	32	0.0	0.0	0.0	4.0
F9-31	72	0.6	1.0	43	0.0	5.0	0.2	0.2
F12-61	75	0.0	0.0	41	1.9	0.6	1.3	0.6
F21-14	64	0.0	0.0	34	12.5	1.2	0.0	1.0
H394-5	70	0.0	0.0	19	0.0	0.0	10.5	4.2
H413-5	60	0.0	0.0	29	0.6	0.0	2.1	0.3
G94-12	<60	8.1	1.6	60	3.1	8.1	8.2	13.6
G573-1	64	5.1	1.2	58	0.0	2.0	8.4	1.7
G694-15	64	8.1	1.3	46	1.2	0.0	0.0	3.9
H162-3	<60	4.4	1.6	24	0.0	0.0	0.3	0.0
H93-3	<60	3.3	2.6	45	0.0	0.0	0.4	0.9
H474-4	<60	0.0	0.0	25	0.0	0.6	0.9	1.8
Abnaki (2)	66	0.0	0.0	16	0.6	4.4	1.4	11.0

^{1/} See footnote 1 New York Table 2 for seed sources.^{2/} 1.0 omitted from all specific gravity readings.^{3/} Average score of affected tubers.

New York Table 4. Percent stand, vine score, and yield of various breeding lines of potatoes grown in soils that were naturally infested with the organisms that are associated with Verticillium wilt on Long Island in 1971 (Nonreplicated, 20-hills, 12-inch spacing).

Line 1/	Percent stand 5/26	Vine score 8/9	Yield per acre		No. of tubers per hill	
			Total CWT	2-inch minimum ₂ /CWT Percent	Total	2-inch minimum
Cascade	100	5	338	281 66	7.0	4.6
F21-19	100	3	146	104 54	4.2	2.3
G92-6	100	4	258	211 68	6.3	4.2
H93-2	95	3	104	73 60	2.8	1.7
H213-7	100	5	119	96 61	3.8	2.4
H413-2	95	2	254	208 66	6.5	4.3
J62-11	95	6	123	96 64	3.2	2.1
J99-5	100	4	227	200 77	5.5	4.2
J107-12	90	5	269	242 83	6.3	5.3
J137-4	85	6	146	134 66	3.8	3.2
J249-17	100	3	334	277 76	7.4	5.6
F293-10	95	6	300	277 84	5.8	4.9
NY-30	100	6	108	58 40	3.9	1.6
BR6316-4	90	7	211	204 92	4.4	4.1
BR6316-7	100	5	227	138 46	7.4	3.4
BR6316-7	100	5	323	234 56	9.0	5.0
B5267-2	90	6	246	208 77	6.6	5.1
B5458-6	95	7	111	73 54	3.1	1.7

(New York Table 4 continued on next page)

New York Table 4 (Concluded).

Line 1/	Percent stand 5/26	Vine score 8/9	Yield per acre		No. of tubers per hill	
			Total CWT	2-inch minimum 2/ Percent	Total	2-inch minimum
B5647-8	100	7	173	127 61	5.3	3.2
B6038-1	100	3	85	42 42	2.5	1.0
B6138-3	95	2	357	292 68	9.8	6.6
BR6316-5	95	7	154	119 66	4.0	2.6
B6516-27	100	5	181	158 80	4.2	3.4
B6535-10	100	7	158	123 70	3.9	2.8
B6545-7	85	6	184	135 62	5.5	3.4
B6567-12	95	1	377	334 76	7.5	5.7
B6591-7	95	4	184	138 63	5.3	3.4
B6595-5	100	1	384	327 72	9.3	6.6
B6741-23	75	4	227	192 73	6.0	4.4
B6750-11	95	2	65	35 44	2.6	1.2
B6603-6	100	4	323	284 76	6.8	5.2
B6751-13	100	7	142	92 52	4.3	2.2
B6879-5	100	6	208	169 72	5.4	3.9
B6887-6	100	6	223	158 60	6.9	4.2
NY-30	90	5	204	131 52	7.1	3.7

1/ All B and BR lines were from USDA, Crops Research Division, Beltsville, Maryland; rest were from Cornell University, Ithaca, New York.

2/ Based on numbers of tubers.

New York Table 5. Specific gravity and percentage of tubers with various defects when various breeding lines of potatoes were grown in soils that were naturally infested with organisms that were associated with Verticillium wilt on Long Island in 1971 (nonreplicated, 20 hills, 12-inch spacing).

Line	1/ Specific gravity	Pinkeye % Score	3/ Stemend browning % Score	3/ Internal necrosis	Hollow heart	Growth cracks	Knobs		
Cascade	61	2.5	2.0	45	1.4	2.5	0.0	2.2	5.6
F21-19	68	5.0	1.5	32	1.3	2.5	0.0	0.0	0.0
G92-6	61	5.0	1.0	52	3.5	0.0	0.0	3.4	12.6
H93-2	--	3.1	1.0	41	3.6	0.0	6.2	15.6	6.2
H213-7	65	10.0	2.0	62	2.2	2.5	2.5	0.0	0.0
H413-2	64	0.0	0.0	32	1.3	0.0	0.0	0.0	0.0
J62-11	<60	0.0	0.0	84	2.2	0.0	0.0	0.0	0.0
J99-5	71	0.0	0.0	32	1.6	0.0	2.5	0.0	0.0
J107-12	66	7.5	1.7	52	2.1	0.0	7.5	1.1	0.0
J137-4	64	0.0	0.0	72	2.6	2.5	2.5	0.0	0.0
J249-17	<60	0.0	0.0	8	1.3	0.0	0.0	0.0	0.0
F293-10	<60	0.0	0.0	30	1.2	0.0	2.5	3.2	0.0
NY-30	--	6.4	2.5	26	1.0	0.0	0.0	0.0	3.2
BR6316-4	64	37.5	1.9	100	2.7	0.0	2.5	0.0	5.3
BR6316-7	71	0.0	0.0	75	2.9	0.0	30.0	0.0	10.8
BR6316-7	78	0.0	0.0	98	3.5	0.0	10.0	0.0	3.0
B5267-2	65	10.0	2.8	42	1.9	2.5	2.5	1.1	13.2
B5458-6	<60	0.0	0.0	34	1.4	0.0	0.0	3.1	0.0

(New York Table 5 continued on next page).

New York Table 5 (Concluded).

Line _{1/}	Specific gravity _{2/}	Pinkeye % Score _{3/}	Stemend browning % Score _{3/}	Internal necrosis	Hollow heart	Growth cracks	Knobs
B5647-8	68	0.0	0.0	32	1.2	0.0	0.0
B6038-1	--	0.0	0.0	38	2.2	0.0	4.8
B6138-3	78	0.0	0.0	55	1.4	0.0	2.4
BR6316-5	61	2.5	1.0	88	3.2	20.0	4.1
B6516-27	67	0.0	0.0	32	2.3	0.0	0.0
B6535-10	<60	0.0	0.0	40	2.2	0.0	30.9
B6545-7	<60	2.5	1.0	55	1.9	0.0	1.7
B6567-12	68	0.0	0.0	22	2.1	7.5	5.7
B6591-7	78	2.5	1.0	42	1.8	0.0	1.5
B6595-5	79	5.0	1.0	32	1.5	2.5	0.0
B6741-23	<60	5.0	1.0	45	2.3	5.0	0.0
B6750-11	--	0.0	0.0	22	2.6	0.0	4.4
B6603-6	77	0.0	0.0	38	2.7	5.0	10.7
B6751-13	<60	0.0	0.0	48	2.1	0.0	0.0
B6879-5	<60	12.5	1.2	72	1.6	2.5	0.0
B6887-6	<60	12.5	1.6	85	2.8	2.5	3.7
NY-30	<60	7.5	1.7	28	1.4	2.5	1.5

_{1/} See footnote 1, New York Table 4 for sources of seed tubers.

_{2/} 1.0 was omitted from all specific gravity readings; -- indicates there were less than eight pounds of tubers available; consequently, specific gravity readings were not taken.

_{3/} Average score of affected tubers.

NEW YORK (Long Island)

S. Dallyn, P. Schippers and D. Fricke

Varieties planted 4/8, 9" apart in 34" rows.

Fertilization - 2250 lbs/A 8-16-8 plus 40 lbs N on cover crop the previous fall.
Vines killed 9/7 and harvested 10/5-6.

Samples for quality and storage determinations were cured at approximately 65° F and specific gravity readings made 10/22, black spot 10/26, chipping and cooking 10/28 - before going into controlled storage.

Among the named varieties Cascade and Reliance looked very good plus Alamo as an early. Abnaki and Raritan rated high in several factors but both are susceptible to hollow heart. Among the NY lines nos. 41, 46, and 51 show promise and from the USDA, nos. BR6316-5, BR6316-14, B6879-5, B6545-7, B6741-23, B6376-6, BR68-20-29, and B6741-11.

New York Table 1. Long Island Vegetable Research Farm, Riverhead, New York, Potato Variety Trial - 1971

Variety Source	Yield - Cwt/Acre		Cull	Jumbo Hollow Heart	Appear- ance ² / Rating ³	Date Plants Dead 50%	Specific Gravity	Black ³ / Spot ³		Chip ⁴ / Color ⁴
	"A" ¹ / 2-3 ¹ / ₂ "	"B" ¹ / Jumbo								
NY47 - Cornell	462	417	17	45	7	0	1.0720	1.84	67	
Onaway - W. Karsten, Mich.	461	429	18	32	22	0	1.0625	2.40	40	
Cascade - Me. Seed Bd.	432	396	20	36	12	0	1.0730	0.88	78	
NY51 - Cornell	413	367	15	46	1	50	1.0607	2.68	52	
BR68-20-29 - U.S.D.A., Me.	386	358	18	28	5	20	1.0585	1.68	68	
Abnaki - Me. Seed Bd.	386	307	8	80	6	64	1.0695	1.80	76	
BR63-16-7 - U.S.D.A., Me.	385	381	24	4	10	100	1.0792	1.84	70	
B5141-6 - Me. Seed Bd.	382	374	20	8	1	0	1.0905	2.24	80	
NY46 - Cornell	379	355	17	24	4	18	1.0720	3.28	77	
Reliance - Me. Seed Bd.	376	330	15	46	10	9	1.0605	1.80	53	
NY41 - Cornell	370	313	9	57	14	5	1.0739	3.44	64	
B6376-6 - U.S.D.A., Me.	364	315	11	48	6	0	1.0683	1.92	77	
New Haig - Shaver, Neb.	361	357	26	4	10	20	1.0638	1.88	65	
Raritan - Me. Seed Bd.	349	334	23	15	8	50	1.0880	2.40	78	
B6545-7 - U.S.D.A., Me.	348	348	35	0	13	0	1.0625	1.68	50	
NY48 - Cornell	347	329	13	17	8	0	1.0625	1.68	69	
BR6316-14 - U.S.D.A., Me.	346	290	7	56	8	27	1.0725	1.52	80	
Katahdin - Cornell	345	303	11	42	1	0	1.0650	2.12	82	
NY45 - Cornell	344	319	16	25	1	8	1.0682	2.64	73	
B6741-23 - U.S.D.A., Me.	339	326	24	14	3	0	1.0609	1.20	75	
B6879-5 - U.S.D.A., Me.	331	318	26	13	1	14	1.0641	1.60	80	
Alamo - Burt, Me.	306	300	25	6	7	0	1.0533	0.92	60	
Oromonte - Me. Seed Bd.	296	288	19	9	3	0	1.0734	1.32	75	
B6741-11 - U.S.D.A., Me.	291	269	14	22	4	0	1.0620	1.40	76	
Wauseon - Me. Seed Bd.	291	265	13	26	6	5	1.0580	1.24	76	
B67-51-13 - U.S.D.A., Me.	274	262	26	13	7	0	1.0523	2.40	38	
Chippewa - Esco Pot. Exch., Me.	274	229	14	46	2	9	1.0564	2.28	64	

New York Table 1. (Continued)

Variety-Source	Yield - Cwt/Acre		Cull	Jumbo		Hollow Heart	Appear. Rating ² /	Date Plants 50% Dead	Specific Gravity	Black Spot ³ /		Chip ⁴ /
	"A" 1/2	"B" 2-3 1/2		"A" 1/2	"B" 2-3 1/2					Spot	Color	
Norchip - Harrington, Me.	267	267	20	0	2	0	3.0	8/9	1.0757	2.76	2.76	80
Haig - Shaver, Neb.	266	264	47	2	1	0	3.5	7/26	1.0585	2.00	2.00	69
Seminole - Me. Seed Bd.	262	239	7	23	5	41	3.0	8/11	1.0711	3.24	3.24	73
BR6316-5 - U.S.D.A., Me.	261	261	16	0	1	0	4.2	8/2	1.0746	1.44	1.44	78
B6887-6 - U.S.D.A., Me.	239	239	37	0	61	0	1.9	8/11	1.0578	1.44	1.44	62
Russet Burbank - Ryan, N.D.	226	223	27	3	36	0	3.2	8/21	1.0670	1.72	1.72	81
Superior - Hutchinson, Me.	225	212	8	12	9	9	3.4	8/1	1.0625	2.00	2.00	69
NY50 - Cornell	223	212	15	11	4	9	3.7	8/11	1.0612	1.28	1.28	60
B6741-16 - U.S.D.A., Me.	221	198	13	23	8	0	3.1	8/7	1.0659	2.24	2.24	70
Monona - Me. Seed Bd.	207	194	8	13	1	18	2.9	8/4	1.0497	1.36	1.36	79
B6750-11 - U.S.D.A., Me.	202	202	64	0	3	0	2.4	8/22	1.0700	2.60	2.60	75
Katahdin - L.W. Kenney, Me.	199	191	15	8	1	0	3.3	8/13	1.0638	2.32	2.32	77
Norgold Russet - H. Smith, Me.	162	161	25	1	5	0	4.0	8/1	1.0497	1.96	1.96	48
B6731-3 - U.S.D.A., Me.	153	153	47	0	0	0	3.3	7/28	1.0562	1.04	1.04	69
L.S.D. 5%	55											

1/ 2" min.

2/ 1 - poor, 5 - excellent

3/ 0 - none, 5 - severe

4/ Agtron - higher the no. the lighter the chip.

Variety-Source	Color	Cooking Quality 10/28			Comments
		Discolor- ation	Meali- ness	Dry Matter	
NY47	1	2	3	19.4	Round, white, bright skin, f. deep apical eye, some attached stolons.
Onaway	1-2	2	3	16.9	Variable shape round to oblong, rough, deep eyes, growth cracks.
Cascade	1-2	2	2-38/	19.1	Elongated, white bright skin, shallow eyes. Possible wilt resistance.
NY51	2	1	2-3	18.0	Round, white, bright skin.
BR68-20-29	1-2	1	2	16.5	Round, white, tend rough, deep apical eye, others shallow, good size distribution.
Abnaki	2	1	2-3	20.2	Round, with slight net.
BR63-16-7	2	1-2	3-4	21.8	Variable shape elongated to round, shallow eye, skinning, susceptible to hollow heart.
B5141-6	1-2	3-4	5	24.5	Round, irregular, slightly flat, skinning, daughter tubers, sprouting during curing.
NY46	1-2	2	2-38/	19.5	Round, white, slightly flat, bright skin.
Reliance	2	1	3	16.1	Elongated to round, heavy net, shallow eye.
NY41	2-3	3	4	21.2	Round, slightly irregular, deep apical eye, prominent lenticels, good flavor.
B6376-6	2-3	3	2-3	19.4	Very round, uniform, slight net.
New Haig	2	1	2-3	17.8	Round, tend rough, heavy net.
Raritan	1-2	4	58/	25.2	Round to elongated, heavy net, shallow eye, some hollow heart in 2-3½ size, some daughter tubers, sprouting during curing.
B6545-7	1-2	1	2-38/	16.8	Elongated, bright skin, shallow eye.
NY48	2	1	2-3	18.9	Round, shallow eye, good size distribution, shallow eye, some skinning.
BR6316-14	1-2	3	3	20.2	Elongated, flat, shallow eye, large jumbos.
Katahdin (NY)	2	2	2	19.0	Round, white.
NY45	2-3	1	3-4	19.1	Round, uniform shape, prominent lenticels, f. deep apical eye.
B6741-23	2	2	28/	16.9	Oblong, flat, bright skin, shallow eye, very attractive.
B6879-5	2	1	38/	17.2	Round, white, f. small, slight net, shallow eye.
Alamo	1-2	2	28/	15.5	Elongated white, bright skin; shallow eye.
Oromonte	4-5	1	38/	21.3	Irregular round to elongated, flattened, attached stolons, daughter tubers, yellow, sprouting during curing, cooked to pieces.

New York Table 2. (Continued)

Variety-Source	Color	Cooking Quality		Dry Matter	Comments
		5/ Discolor- ation	10/28 Mealiness		
B6741-11	1-2	2-3	2	17.5	Elongated, smooth bright skin, shallow eye, very attractive.
Wauseon	1-2	2	2	16.2	Round, irregular shape, some net.
B67-51-13	2	1	1	14.4	Round, white, skinned, prominent lenticles, shallow eye, watery, sprouting during curing.
Chippewa	2	1	2-3	-	Round to elongated, flat, tend rough.
Norchip	1-2	1	3-4	21.1	Round, irregular shape.
Haig	2	1-2	2	16.5	Round, small, heavy net.
Seminole	2	1	38/	20.7	Flat, irregular, rough, pink eyes, attached stolons.
BR6316-5	1-2	2	38/	19.8	Elongated, net, shallow eye, good size distribution, very attractive, cooked to pieces.
B6887-6	1-2	1	1-2	16.9	Severe growth crack and rotting.
Russet Burbank	2	1	4	20.3	Elongated russet.
Superior	2	1	2	17.9	Elongated to round.
NY50	2	1	3	17.0	Round, bright skin, good size distribution some vascular browning.
B6741-16	2-3	2	2-3	17.9	Elongated variable shape, white.
Monona	1-2	1	1	14.3	Elongated to round variable, deep eye.
B6750-11	2	1	2-3	18.6	Round, white, prominent lenticles, sprouting during curing.
Katahdin (Me.)	1-2	3	38/	18.5	Round, white, some roughness, variable discoloration after cooking.
Norgold Russet	1-2	3	1	16.2	Elongated russet, sprouting during curing.
B6731-3	1	1	1	16.1	Round, small, shallow eye.

5/ Immediately after boiling—1-white, 5-very dark

6/ 15-20 minutes after boiling

7/ 1-soggy, 5-very mealy

8/ Some sloughing.

NEW YORK

R. L. Plaisted and H. D. Thurston

In cooperation with
Anderson, Brodie, Cetas, Ewing, Fernow,
Fricke, Harrison, Jones, Sieczka.

The effort in 1971 was directed toward (1) the regular selection and seed multiplication program, (2) the development of an andigena breeding population, (3) an increase of NY-41, and (4) some small miscellaneous projects.

In the regular selection program, the seedling tubers produced in the greenhouses are 12,000 from tuberosum crosses, and 12,000 from tuberosum x andigena hybrids. From 9,000 hills of tuberosum spaced seedlings, 2,000 were saved and from 1,500 hills of tuberosum x andigena hybrids, 300 were saved. Seven hundred unreplicated 10-foot observation plots produced 140 for further test. In the yield selection phase, 151 entries in the first stage produced 49 selections (Table 1), 25 entries in the second stage produced 4 selections (Table 2), and none of the 4 entries in the third stage (Table 4) were saved. Among the 11 entries in the advanced yield trials (Table 5), only NY-41 was identified as worthy of continuing. Internal defects eliminated several clones with otherwise desirable attributes.

The clone, NY-41, was increased in a five-acre field of tuber units planted in rows 6 feet apart. The production will be used in 1972 to initiate certified seed production and to plant several one-acre demonstration plots on Long Island. Clone NY-41 is a good yielding, golden nematode-resistant clone.

The program of selection within andigena consisted of two phases. The first was the production of 12,000 greenhouse seedlings of the advanced population selected for blight resistance. The second phase was the production of 17,000 seedling hills of an initial population derived from 910 accessions. The sources of seed were the IR-1 and CPC collections, and the national programs in Peru, Ecuador, and Colombia. Even though they were planted in mid-May and not harvested until early October, approximately 4/5 of the clones had no tubers. Most of the remainder had tubers that ranged between 1/2" and 1" in diameter. Fruit were harvested from 1620 hills and tubers saved from 241 additional hills that had no fruit. These will be intercrossed in the greenhouse to produce seed. The selections represent 587 of the original families. This seed plus 100 new accessions will be tubered in the greenhouse in 1972. Results with several families grown from greenhouse tubers and from direct transplants indicates the greenhouse production effectively eliminates several of the clones which will be very late in maturity.

A study was concluded of the inheritance of the trait described as "Knobby tuber" in Katahdin by Bonde & Merriam. It appears to be transmitted by two loci with a dominant allele required at each locus. A plot was established to evaluate 122 andigena clones for resistance to PVY. Apparent resistance was found in two families. These were replanted in 1971 for an additional season of exposure. Hybrids between the resistant clones and tuberosum were also included for test.

The golden nematode resistance program has depended primarily on the andigena gene for resistance to race A. An effort has been made to develop clones with the genes for resistance found in S. vernei. The last three years have produced several clones of variety potential with resistance from vernei. The segregation patterns revealed that all of these carried only a single gene for resistance, tho vernei has at least 2. These clones were intercrossed to determine if the original genes could be recombined in a single clone. As a part of this study, these clones as well as the original vernei source and alternate sources of resistance were taken to Peru for evaluation against the aggressive forms of the nematode found there. All of the vernei derivatives were as susceptible as the andigena derivatives even tho the diploid vernei showed a broader range of resistance. This discovery has prompted Cornell to expand the golden nematode breeding program, giving Dr. Anderson responsibility to work with Dr. Brodie and the USDA in developing alternative sources of resistance with proven response to the native races of the nematode. The species he is using are S. vernei, S. spegazzinii, S. neohawkesii, and S. famatinae.

New York Table 1. K's - First Year Yield Trial - 1971. Four replications of 15-foot plots at Ithaca. Selections saved from 151 entries Planted 11 May; Harvested 13 Sept.

Pedigree	GN ¹	Chip ²		Specific Gravity		Vert. Wilt ³		Yield Data (cwt/A)					Int. ⁵ Necr.	Ht ⁴	Appear. ⁶	Growth Cracks
		50°	Field	1970	1971	Vine Score	Crop	Total	%							
									70	71	1970	1971				
Katahdin(8x)	+	I	A	1.076	1.081	5	5	296	285	263	89	3/64	0	3.6	0 to occ	
K4-18	-	I	U	1.075	1.078	5		402	380	347	86	4/20	0	3.2	occ, few	
16-37	+		A	1.074	1.084	4		334	316	292	87	0	0	2.8		
21-1	-	A ⁺		1.087		7		332	316	281	85	0	0	3.8		
21-15	-	U	U	1.079	1.087	6		387	365	327	84	0	0	3.0		
21-41	-	I	U	1.079	1.078	5		373	355	319	86	0	0	2.8		
21-45	-	A	A	1.077	1.078	5		401	375	345	86	0	0	3.8	occ	
31-5	-	I	U	1.077	1.073	5		283	267	250	88	1/8	0	3.2	few	
36-17	-	A	U	1.078	1.084	5		313	300	272	87	0	0	3.2		
37-1	-	U	A	1.076	1.084	4		430	415	394	92	1/8	0	4.0		
37-12	-	I	A	1.082	1.080	7		342	325	288	84	0	0	4.0	sev ² , few	
38-22	-	U	A	1.067	1.074	5		401	386	378	94	0	0	3.5		
42-11	+	I	A	1.083	1.085	5		311	299	286	92	0	0	3.0		
49-17	-	U	U	1.077	1.077	5		386	353	321	83	0	0	4.2		
56-2	-	A	A	1.082	1.088	5		318	304	270	85	0	0	3.8		
56-7	-	I	A	1.078	1.074	7		393	350	345	88	0	0	4.0	occ	
59-7	-	U	A	1.068	1.077	5		401	391	370	92	0	0	4.5	few	
59-55	-	I	A	1.072	1.068	7		334	317	284	85	0	0	3.0		
59-63	-	U	U	1.074	1.086	6		330	315	286	87	2/20	0	3.0	few	
60-1	+	U	A	1.070	1.076	5		405	394	362	89	0	1/8	3.0	occ ²	
60-20	-	A ⁺	U	1.078	1.078	5		351	342	321	91	0	0	3.8		
60-30	-	A	U	1.076	1.084	5		378	364	347	92	1/8	0	3.8		
60-32	-		U	1.073	1.081	5		438	422	396	90	0	0	3.2		
60-52	-	U	U	1.081	1.080	6		437	421	408	93	2/8	0	3.5	few	
81-10	-		U	1.071	1.071	5		408	388	362	89	0	0	3.8		
290-6	-	A ⁺	A	1.093	1.083	6		290	280	264	91	0	0	4.2		
292-6	-	U	U	1.088	1.088	7		357	340	316	89	0	0	4.2		
296-8	-	I	A	1.083	1.075	4		317	304	275	87	1/8	0	3.5		
297-3	-	U	A	1.077	1.083	7		365	338	306	84	0	0	4.2	few	
313-10	-	U	A	1.081	1.082	4		379	358	316	83	0	0	3.2		
341-10	-	U	U	1.079	1.083	7		382	364	330	86	1/8	0	3.2	occ	
349-7	-	A ⁻	U	1.070	1.067	6		347	336	324	93	0	0	3.8		
357-16	-	U	A	1.080	1.083	3		422	401	371	88	1/8	0	3.2		
460-1	-	U	A	1.077	1.079	7		426	401	359	84	0	0	3.2		
468-4	+	A	A	1.070	1.077	3		374	356	336	90	3/20	0	3.5		
527-9	-	I	A	1.073	1.073	7		358	341	303	85	0	0	4.0		

Table 1 continued.

Pedigree	Chip ^{2/} 50° Field		Specific Gravity		Vert. Wilt ^{3/} Vine Score		Crop 1971	Yield Data (cwt/A)				5/ Int. Necr.		Growth 6/ Cracks
	GN ^{1/}	70 71	1970 1971		1970 1971			Total	1-7/8	2-1/4	2-1/4	HHT	Appear.	
			1970	1971	1970	1971								
557-1	-	A	A	1.083	1.083	4	-	365	338	282	77	1/8	0	3.5
557-14	-	I	A	1.087	1.086	5	-	369	347	323	88	3/20	0	3.0
562-5	-	U	U	1.075	1.080	6	-	453	434	387	85	0	0	3.0
565-5	-	A	A	1.082	1.080	6	-	386	358	290	75	0	0	3.8
565-16	-	I	U	1.082	1.097	5	-	399	364	328	82	0	0	3.0
567-18	-	U	A	1.072	1.081	3	++	341	312	270	79	0	0	3.5
585-8	-	A	A	1.073	1.080	4	+	335	321	309	92	0	0	4.2
586-3	-	U	A	1.076	1.086	4	+	428	408	387	90	0	0	3.2
591-31	-	I	A	1.088	1.097	3	-	386	368	329	85	0	0	4.0
635-15	-	U	A	1.070	1.070	7	-	399	380	352	88	1/8	0	2.5
653-1	-	I	A	1.080	1.081	5	-	369	355	317	86	1/8	0	3.2
653-12	-	U	A	1.081	1.080	5	-	350	335	300	86	0	0	3.2
653-16	-	U	U	1.084	1.080	5	+	304	292	273	90	1/8	0	3.2
USDA 2511	-	I	A	1.082	1.070	5	+	328	315	287	88	0	0	5.0

1/ GN. Golden nematode. + = susceptible, - = resistant

2/ Chip. A= acceptable, U = unacceptable, I = intermediate

3/ Vert. Wilt. 5 or lower is resistant. + = good crop in unreplicated plot on infested soil.

4/ HHT. Hollow heart

5/ Int. Necr. Internal necrosis.

6/ Appearance. 1 = very rough to 5 = very nice.

New York Table 2. J's Second Year Yield Trial - 1971. Six replications of 15-foot plots at Ithaca and Riverhead.
 Selections saved from 25 entries.

Pedigree GN	Chip	Specific Gravity		Vine	Vert. Wilt		Score Crop		Yield Data (cwt/A)					Int.	
		6 wk. 40° 1969	50% 1970		1971	1970	1971	Total	>1-7/8	>2-1/4	>2-1/4	Ht	Necr.	Appear.	Notes
Katahdin +	U	1.082	5	5	5	5	5	339	328	308	91	3/24	0	3.4	
		1.080						Riv.	284	236	277	98	0	1/32	4.1
		1.079													
J57-3	- U A	1.086	7	6	-	Ith.	359	342	311	87	0	0	3.5		
		1.078													
		1.070													
J59-10	- I U	1.081	6	6	+	Ith.	439	426	406	92	1/24	0	3.3	few gc ²	catface ²
		1.072				Riv.	398	384	340	85	0	1/10	3.4	catface ²	
		1.074													
J333-2	- I U	1.077	7	7	+	Ith.	283	275	264	93	0	0	4.0	occ gc	
		1.072				Riv.	310	310	273	88	0	0	4.5		
		1.065													
J370-3	- A U	1.090	4	5	+	Ith.	320	306	274	86	1/24	0	3.2	catface	
		1.079													
		1.086													

few gc² = few growth cracks noted in 2 replications.

occ gc = occasional growth cracks noted in 1 replication.

New York Table 3. Campbell Soup Company Trial. Six replications of 15-foot plots at Ithaca.

	Yield				Appear.	HHT.	Int.		Notes ¹	S.G.
	Total	> 1-7/8	> 2-1/4	> 2-1/4			Necr.			
BR5960-5	342	325	274	80	3.5	0	0	Small ³	1.087	
BR6316-7	341	324	270	79	2.7	9/24	0	Small	1.092	
BR6306-22	233	213	175	75	2.5	1/24	0	few gc, sev gc ² , K	1.062	
BR6456-1	303	289	255	84	4.5	0	0		1.069	
BR6626-5	380	363	320	84	3.7	0	0		1.086	
Katahdin	339	328	308	91	3.4	3/24	0		1.079	

^{1/} gc = growth cracks, sev = several, K = knobs. Superscript indicates number of replications in which observation was made.

New York Table 4. H's Third Year Yield Trial - 1971. Six replications of 20-foot plots.
Ithaca and Riverhead

Pedigree	Yield				SG	Appear.	Growth Cracks cwt	Misshapen cwt	HHt.	Int. Necr.
	Total cwt	>1-7/8 cwt	>2-1/4 cwt	% >2-1/4						
Katahdin										
Ithaca 2x	350	336	305	87	1.083	3.5	1	1	3/48	0
Rivhd. 1x	264	259	206	78		4.2	0	0	0	0
H93-2										
Ithaca	334	307	263	79	1.074	3.5	8	1	0	0
Rivhd.	295	290	223	76		3.8	0	0	1/12	0
H162-3										
Ithaca	306	292	268	88	1.077	4.5	t	2	0	0
Rivhd.	288	281	220	76		4.5	0	0	1/12	0
H213-7										
Ithaca	333	313	295	89	1.089	3.7	3	2	2/24	2/24
Rivhd.	324	316	256	79		4.7	0	0	0	0
H474-4										
Ithaca	345	289	264	77	1.068	2.2	36	0	0	0
Rivhd.	250	235	195	78		3.8	1	0	0	0

New York Table 5 Advanced Yield Trials - 1971. Ithaca and Riverhead - 6 replications of 20' plots two rows wide.
Cato - 4 replications of 20' plots two rows wide.

Pedigree	Yield				SG	Appear.	Growth Cracks cwt	Misshapen cwt	HHt.	Int. Necr.
	Total cwt	> 1-7/8 cwt	> 2-1/4 cwt	% > 2-1/4						
<u>Katahdin</u>										
Ithaca 2x	340	326	301	89	1.080	3.5	2	1	2/96	0
Rivhd. 2x	305	296	248	81		3.9	0	1	1/48	0
Cato 2x	226	213	164	73		4.4	1	1	0	0
<u>NY-6</u>										
Ithaca	422	382	342	81	1.076	3.2	30	1	0	0
<u>NY-41</u>										
Ith. 6"	404	384	359	89	1.081	3.1	10	0	1/48	0
Ith. 9"	386	354	330	85	1.081	2.8	24	1	1/48	0
Riv. 6"	391	380	327	84		4.2	0	0	1/24	0
Riv. 9"	382	378	334	87		4.1	1	1	0	0
Cato 9"	263	242	195	74		3.5	3	12	0	1/20
<u>NY-45</u>										
Ithaca	349	333	297	85	1.080	3.1	8	0	8/48	1/48
Riv.	336	329	264	79		4.0	0	t	2/24	0
Cato	205	188	130	63		3.2	1	8	0	0
<u>NY-46</u>										
Ithaca	411	397	358	87	1.089	3.2	2	4	0	0
Rivhd.	283	273	166	59		3.7	t	1	1/24	0
Cato	215	187	125	58		2.8	1	1	0	0
<u>NY-47</u>										
Ithaca	344	325	289	84	1.090	3.2	4	1	3/48	4/48
Rivhd.	407	385	317	78		4.0	1	1	0	10/32
Cato	312	279	228	73		3.8	1	16	0	1/8
<u>NY-48</u>										
Ithaca	359	343	311	87	1.077	4.2	5	0	0	3/48
Rivhd.	332	313	241	73		4.2	3	t	0	6/24
Cato	230	198	140	61		4.5	20	2	0	0

Table 5 cont'd.

Pedigree	Yield				SG	Appear.	Growth Cracks cwt	Misshapen cwt	Ht	Int. Necr.
	Total cwt	> 1-7/8 cwt	> 2-1/4 cwt	> 2-1/4 %						
<u>NY-49</u> Ithaca	385	364	328	85	1.085	3.2	4	5	4/48	0
<u>NY-50</u> Ithaca	350	329	284	81	1.080	3.9	6	3	2/48	0
Rivhd.	298	287	234	79		4.8	4	2	0	0
Cato	164	151	117	71		4.5	11	1	6/20	0
<u>NY-51</u> Ithaca	412	395	349	85	1.077	4.0	1	1	3/48	0
Rivhd.	523	515	466	89		4.2	2	t	28/74	3/74
Cato	330	303	236	72		4.0	6	5	29/40	0
<u>NY-52</u> Ithaca	356	325	286	80	1.085	3.2	7	5	0	0
Rivhd.	284	269	196	69		3.2	t	t	0	0
Cato	199	173	116	58		3.2	10	1	0	0
<u>F9-31</u> Cato	229	197	156	68		2.5	1	14	2/20	6/20

New York

J. B. Sieczka and E. E. Ewing

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Results of Potato Variety Trials in Upstate New York

Five variety trials were conducted by the Vegetable Crops Department of Cornell University in 1971. Three trials were conducted on mineral soils in Tompkins and Madison Counties. Two others were located on muck soils in Canastota and Elba, New York. The trials not located in Tompkins County were conducted in cooperation with Richard Ackerman and Kenneth Stone of New York State Cooperative Extension.

Table 1 contains the results of a trial in which U.S.D.A. selections and two promising seedlings from the New York and the Pennsylvania State Potato Breeding Programs were compared to the standard varieties, Katahdin, Kennebec and Russet Burbank. BR 5960-5 produced the highest yield of marketable tubers. The tubers of this selection and B 6139-11 had the highest specific gravity in the trial. Total and marketable yields of most entries were similar to Katahdin. Only Russet Burbank and B 6529-12 produced less than 300 cwt. of marketable tubers per acre.

Tubers of BR 5960-5 are round to oblong and tend to be pear shaped with deep apical eyes. The tuber shape may limit this selection's acceptance in the tablestock market. BR 6312-2 is a late maturing selection which produced tubers with the lowest specific gravity. Small tubers were formed at the eyes of some over-size tubers of this entry.

Attractive, oblong tubers with a slightly netted skin were produced by BR 6316-5. Tubers of B 6518-4, which were round to oblong with shallow lateral eyes but moderately deep apical eyes, also were suited for the tablestock market. Large tubers of N.Y. 41 and 6HS9 were irregular in shape. A significant amount of hollow heart was observed in 6HS9, B 6139-11 and B 6529-12. Tubers of B 6567-12 were "rough" appearing and had deep apical eyes and pink eye brows.

N.Y. 48, N.Y. 47, Katahdin and B 6273-1 were the only entries listed in Table 2 which did not have a high percentage of internal defects. Tubers of N.Y. 48 were slightly irregular and had a tendency to growth crack. N.Y. 47 is a late maturing seedling which produces slightly flattened tubers with shallow eyes. Internal necrosis may be a potential problem for both selections. A high percentage of the tubers produced by BR 6273-1 had growth cracks.

B 6097-7, which has looked promising in previous trials, yielded well this year. The selection did, however, have a tendency to form misshapen tubers and had a significant amount of internal necrosis and hollow heart in this trial. Another seedling grown in the guard row, B 6545-20, produced attractive tubers with shallow eyes.

Madison County. Cascade looked promising in the Madison County trial conducted on mineral soil. It produced the highest total and marketable yields in the trial. Tubers of this variety are oblong with shallow eyes. Oversize may be a problem. The variety has midseason maturity.

Norchip had the highest specific gravity in the trial. Tubers of this variety were irregular in shape. Smooth, round and uniform size tubers were produced by B 5698-8. The latest maturing cultivar, B 6448-8, had the lowest yield and specific gravity.

Chieftain outyielded the other red skinned variety, Norchief, in the variety trial conducted on muck soil (see Table 4). Tubers of both varieties were attractive in appearance but the skin of Norchief tubers was a deeper red.

York, the white skinned variety in the trial, produced a low yield of small, round tubers which had a high specific gravity.

Elba. Peconic spaced at nine inches yielded as well as Katahdin spaced at seven inches on the Elba Muck. The specific gravity of Peconic tubers was higher than Katahdin tubers (see Table 5).

Storage Trial Results. Seminole produced lighter chips on February 22, 1971, than on September 10, 1970, whereas the opposite was true for Superior. Sable produced chips which were extremely dark (see Table 6).

B 5698-8; Kennebec, B 6138-3 and Russet Burbank produced very light chips when stored at 50°F. Raritan was extremely susceptible to after-cooking darkening while B 5740-2 and Russet Burbank were relatively free of darkening.

B 6138-3 sprouted most rapidly in storage. B 6097-7 also sprouted early.

Acknowledgements. Seed for the trials was obtained from the following sources: N. Y. seedlings, R. L. Flaisted; 6HS9, W. Mills, Pennsylvania State; Sable, H. T. Davies, Canada Department of Agriculture; York, C. Smeekens, Ontario, Canada; seedlings prefixed by BR, C. E. Cunningham, Campbell Institute for Agricultural Research; all other seed obtained from R. E. Webb, U.S.D.A.

The cooperation of V. Chapman, J. Coulter, A. Vigneri, R. Ackerman and K. Stone is appreciated.

Upstate New York Table 1. Variety Trial, Freeville, N. Y. 1971 ^{1/}

Variety	Total Yield cwt/A	U. S. No. 1				
		cwt/A		% of Total Yield		
		2 - 3 $\frac{1}{4}$ "	3 $\frac{1}{4}$ - 4"	2 - 3 $\frac{1}{4}$ "	3 $\frac{1}{4}$ - 4"	>4"
BR 5960-5	561	230	264	40.9	47.0	4.6
BR 6312-2	528	190	223	36.0	42.2	8.2
BR 6316-5	472	197	213	38.9	45.1	2.2
B 6567-12	561	199	208	35.4	37.0	5.3
B 6518-4	505	181	216	35.9	42.8	8.4
NY 41	523	188	205	35.9	39.2	7.0
Katahdin	500	149	224	29.8	44.8	6.4
6HS9	516	204	158	39.6	30.7	8.9
B 6139-11	469	218	143	46.4	30.5	2.4
Kennebec	533	136	179	25.5	33.6	8.6
Russet Burbank	407	244	34	60.1	9.7	0
B 6529-12	474	76	169	16.1	35.7	16.1
D(05) Tukey	74	88	84			

Variety	Mean Tuber Wt. (oz.)	Specific Gravity	Vine ^{2/} Maturity	% of Total Yield		Hollow ^{3/} Heart
				Mis.	Sun- burn	
BR 5960-5	7.4	1.082	4	2.2	2.5	1/40
BR 6312-2	8.3	1.064	1	5.8	5.0	8/40
BR 6316-5	8.2	1.080	5	1.5	6.3	7/40
B 6567-12	8.5	1.075	5	10.8	9.4	3/40
B 6518-4	7.4	1.066	4	2.2	6.9	2/41
NY 41	7.5	1.073	5	3.5	11.0	0/40
Katahdin	8.0	1.078	5	2.9	12.5	2/40
6HS 9	7.6	1.072	5	4.2	12.7	16/42
B 6139-11	6.4	1.082	5	1.9	12.7	14/40
Kennebec	9.6	1.076	4	12.6	15.9	4/40
Russet Burbank	7.8	1.080	1	15.9	1.2	0/40
B 6529-12	10.2	1.068	6	21.7	8.9	37/43
D(05) Tukey	1.6	.007				

^{1/} Planted May 7, within row seed spacing 9", between row spacing 34", 1500 #/A of 10-20-20 applied at planting, killed September 8, 1971, harvested September 29, 1971, 4 replications.

^{2/} Vines rated for maturity on August 29, 1971, 1-9; 9 = completely dead, 1 = completely green.

^{3/} Numerator = number of tubers with hollow heart, denominator = total number of tubers observed.

Upstate New York Table 2. Trial with N. Y. Selections, Freeville, N.Y. 1971^{1/}

Variety	Total Yield cwt/A	U. S. No. 1				
		cwt/A		% of Total Yield		
		2 - 3 $\frac{1}{4}$ "	3 $\frac{1}{4}$ - 4"	2 - 3 $\frac{1}{4}$ "	3 $\frac{1}{4}$ - 4"	> 4"
N. Y. 51	667	214	309	32	46	9
B 6558-16	493	238	183	48	37	3
N. Y. 46	489	271	147	55	30	2
N. Y. 48	469	267	151	57	32	1
N. Y. 47	523	160	254	31	49	10
N. Y. 45	483	195	198	40	41	6
Katahdin	489	169	223	35	46	9
BR 6273-1	418	172	128	41	31	4
Guard Row ^{4/}						
B 6097-7	666	318	92	48	39	0
B 6545-20	522	226	160	43	31	4
D .05 Tukey	98	38	71			

Variety	Mean Tuber Wt. (oz.)	Spec. Grav.	Vine ^{2/} Mat.	% of Total Yield		Hollow ^{3/} Heart	Int. ^{3/} Nec.
				Mis.	Sunburn		
N.Y. 51	8.3	1.073	6	3	7	24/42	2/42
B 6558-16	7.0	1.074	5	4	3	0/40	12/40
N.Y. 46	6.6	1.080	4	3	5	0/40	10/40
N.Y. 48	6.8	1.065	4	3	3	0/40	5/40
N.Y. 47	8.3	1.084	1	4	4	0/40	6/40
N.Y. 45	7.8	1.077	5	2	8	5/40	30/40
Katahdin	8.5	1.072	5	1	8	4/40	0/40
BR 6273-1	7.0	1.075	5	12	9	5/30	0/30
Guard Row ^{4/}							
B 6097-7	7.1	1.083		15	11	4/40	8/40
B 6545-20	6.3	1.073		7	9	1/40	0/40
D .05 Tukey	1.1	.008					

^{1/} Planted May 17, 1971, within row seed spacing 9", between row spacing 34", 820 lbs of 10-20-20/A broadcast prior to planting, 1000 lbs of 10-20-20/A applied at planting, killed September 8, 1971, harvested October 1, 1971, 4 replications.

^{2/} Vines rated for maturity on September 4, 1971, 1-9; 9 = completely dead, 1 = completely green.

^{3/} Numerator = number of tubers with hollow heart or internal necrosis, denominator - **total** number of tubers observed.

^{4/} Cultivars in guard rows were replicated 4 times, data not included in AOV.

Upstate New York Table 3. Early Variety Trial, Madison County, N. Y. 1971^{1/}

Variety	Yield (cwt/A)				% of Total Wt.		Specific Gravity	Vine Mat. 2/ 9/9/71	Hollow Heart 3/
	Total	U.S. No. 1			Sunburn				
		1-7/8-3"	3-4"	>4"					
Cascade	471	370	13	43	4	1.070	5	0/10	
Norchip	447	316	26	22	8	1.076	5	0/10	
B 5698-8	403	347	14	11	4	1.070	5	2/10	
B 6448-8	351	264	27	48	8	1.065	1	0/10	
D (.05) Tukey	94	60				.003			

Guard Row 4/									
B 6097-7	667	565	22	-	4	1.079	-	0/10	
Sable	419	301	38	48	3	1.063	-	0/8	
Abnaki	368	317	22	19	4	1.080	-	0/13	

1/ Planted May 25, 1971, within row spacing 9", between row spacing 34", harvested September 9, 1971, 4 replications.

2/ See footnote 2, Table 1

3/ See footnote 3, Table 1

4/ Cultivars in guard row not replicated.

Upstate New York Table 4. Variety Trial on Muck Soil, Madison County, N.Y. 1971^{1/}

Variety	Yield (cwt/A)		% of Total Yield		Specific Gravity	Vine Maturity ^{2/}
	Total	U.S. No. 1 > 2"	< 2"	U.S. No. 1 > 2"		
Chieftain	550	514	6	93	1.068	3
Norchief	473	407	12	87	1.074	7
York	355	307	11	86	1.082	8
D (.05) Tukey	31				.003	
Guard Row ^{3/}						
Abnaki	462	441	3	96	1.074	2
B 6097-7	450	306	22	68	1.083	2
Sable	306	281	6	92	1.063	8
LaRogue	394	321	11	81	1.065	3

1/ Planted May 27, 1971, within row spacing 9", between row spacing 34", harvested October 5, 1971, 4 replications.

2/ See footnote 2, Table 1.

3/ Cultivars in guard row not replicated.

Upstate New York Table 5. Variety Trial on Muck Soil, Elba, N.Y. 1971^{1/}

Variety	Yield (cwt/A)		% of Total Yield		Specific Gravity
	Total	U.S. No. 1	<2 "	U.S. No. 1	
Peconic	399	326	16	82	1.077
Katahdin	365	318	10	87	1.068
D _(.05) Tukey		n.s.			.006

^{1/} Planted June 7, 1971, within row spacing for Katahdin was 7", for Peconic 9"; harvested October 6, 1971; 4 replications.

Upstate New York Table 6. Early Variety Trial, Freeville, N.Y. 1970
Chip Color and Storage Results

Variety	Chip Color ^{2/} Agtron Meter Readings		Sprout Weight as % Total Weight ^{3/} 2/10/71
	9/10/70	2/22/71	
Chippewa	49	51	13
Superior	60	52	10
Sable	31	23	12
Seminole	52	64	6
D _(.05) Tukey	9	9	2

^{1/} Varieties ranked in descending order of U.S. No. 1 (2-4") yields (see 1970 report)

^{2/} Color of crushed chips on Agtron F reflectance colorimeter set so that discs 5005 and 5052.2 gave readings of 0 and 100, respectively. Higher values indicate lighter chip color. Minimum values for "generally acceptable color" would probably range from 55 to 65. Samples fried on 2/22/71 were stored at 50°F. prior to frying.

^{3/} Stored at 50°F.

Upstate New York Table 7. Variety Trial, Freeville, N. Y. 1970

Storage and Cooking Results

Variety <u>1/</u>	Chip Color <u>2/</u> Agtron Meter Readings	After-Cooking Darkening Rating <u>3/</u> 2/3/71	Sprout Weight as % of Total Weight <u>4/</u> 2/15/71
Shurchip	53	4.1	10
Katahdin	54	4.4	7
B 6097-7	53	4.3	15
Sioux	43	4.1	4
Raritan	55	3.1	9
N.Y. 41	38	4.2	3
B 6138-3	65	4.5	18
Kennebec	69	4.4	5
B 5698-8	77	4.5	5
Norchief	51	4.4	10
B 5740-2	44	4.7	9
Russet Burbank	64	4.6	2
D(.05) Tukey	11	0.7	3

1/ See footnote 1, Table 6.

2/ Stored at 50°F until time of frying on January 27, 1971. See footnote 2, Table 6.

3/ Five tubers from each of 4 field replications were peeled and dipped in 0.5% sodium bisulfite; cooked for 7 minutes in an autoclave at 15 p.s.i.; and rated from 1-5, where 1 = severe after-cooking darkening, 5 = no darkening.

4/ Stored at 50°F.

Upstate New York Table 8. Early Variety Trial, Erie County, N. Y. 1970 ^{1/}
Storage and Cooking Results

Variety ^{1/}	After-Cooking Darkening Rating ^{2/} 2/12/71	Sprout Weight as % of Total Weight ^{3/} 2/9/71
Alamo	5.0	3
Sable	5.0	8
Norchief	4.8	3
Norland	4.3	18
D(.05) Tukey	0.6	5

^{1/} See footnote 1, Table 6.

^{2/} See footnote 3, Table 7.

^{3/} Stored at 50°F.

NORTH DAKOTA

Robert H. Johansen and Joseph E. Huguelet

Potato Crossing Program

Two hundred and ninety-eight Potato crosses were made during February, March and April of 1971. Crosses made involved parents with good processing quality, type, disease resistance, good red skin color, russet skin and high yield and quality. True seed was extracted from the berries during May and June and after the seed was dried, it was planted in the greenhouse during June and July.

Greenhouse and Field Seedling. From 200 families, 34,257 seedlings were transplanted into the greenhouse benches during July and August. These seedlings were harvested during October and November.

At the Langdon Experiment Station 27,237 seedling tubers from the 1970 greenhouse crop were planted in the field on May 13 and 14. Only 481 of these seedlings were saved when the plot was harvested on September 27, 28 and 29th. During most years approximately 1500-2000 seedling hills are generally saved, however, because our present program is geared to irradicate spindle tuber it was necessary to reduce the selected number of seedling clones.

Advanced selections. During 1971, 536 second year selections and 171 older selections were planted in trials at Casselton, Grand Forks, and Fargo. The Casselton plot was planted on May 5th, 6th, and 18th, while the Grand Forks plot was planted on May 12th and 13th. Disease readings of the many numbers of tubers indexed for spindle tuber, caused a delay and irregularity in planting.

The increase plot at Casselton produced an excellent yield of good quality tubers. This was gratifying after losing the plot due to flooding for two consecutive years. The 1971 plot was planted in a dryer and better-drained area, however, the rainfall this past summer did not come in heavy torrential showers.

A fairly good seed increase of most lines was obtained. The seed stocks increased at Casselton will be used for 1972 plantings of variety trials and adaptation tests. Tubers from each of the five hills and some individual hills were saved at harvest time for indexing in Florida and in the greenhouse during 1972. This will be part of a program to help irradicate spindle tuber from the breeding material.

Promising Selections. Again several selections looked quite outstanding in 1971. Fairly large commercial plantings of ND6993-13 Russ, ND6925-13 Russ, and ND7196-18 were planted. Of these, ND6925-13 Russ appears to have the most promise as a russet variety. This selection is early and has excellent quality, being particularly good for baking, however, its shape is blocky to somewhat round. ND7196-18 produces chips equal or better than Monona and Norchip. The disappointment of ND6993-13 Russ is the high amount of growth cracking. All of these selections will be again planted in 1972 and if the growers and processors believe these selections have merit they will be considered for introduction within a year or so.

Line ND7103-4 a derivative of Norchip looks quite good. This selection produces smooth oblong to round uniform tubers and has excellent chipping quality. Line ND6634-2R and ND7642-3 Russ also appear to have promise but need further testing. Line ND6647-1R, ND7761-33 Russ and ND6719-36R also have some promise. The selection ND6647-1R has some resistance to verticillium wilt and has nice tuber type, while ND7761-33 Russ has nice tuber type and good russet skin. Line ND6719-36R is an older selection that was returned to the breeding program. The characteristics of ND6719-36R are that it produces high yields of nice uniform tubers, but is very susceptible to air cracking or air checks. If the weather conditions are cool and moist at harvest, ND6719-36R will have as much as 75% of the tubers severely air checked.

Processing Trials. Several new promising selections were planted in processing trials at Grand Forks. Tubers from these samples will be tested this winter by the Wise Potato Chip Company, Berwick, Pennsylvania, The Pillsbury Company, Grand Forks, North Dakota and the Processing Laboratory at East Grand Forks, Minnesota. The plot was planted on May 10th and harvested on September 17th.

Twenty-one Frito-Lay numbered clones and sixty-one Campbell Soup selections were planted in an adaptation and observation trial at Grand Forks. Forty-three of the Campbell Soup selections were new selections while eighteen of the selections were tested last year. Notes on these selections will be taken and sent to their respective company.

Results from advanced North Dakota selections tested by Campbell Soup in 1970-71 showed that ND7103-4 was again good for dicing with a moderate retained weight, low translucency, high protein, low phenols, and low oxidative discoloration. In similar tests ND5761-5, ND6925-13 Russ, ND6993-13 Russ, and Norchip were found to be good for frozen dinner products.

Wise Potato Chip Company reported that the selection ND7097-2 had exceptionally good chipping quality. In their tests this selection has shown excellent chipping quality for the past 3 years, however, a disadvantage of ND7097-2 is its small size and poor yield. Other selections showing good chip quality were ND5979-2, ND7103-4, ND7543-5, and ND5761-5.

Chip tests during 1970 were conducted on 14 selections and varieties grown at Grand Forks and Park River (North Dakota Tables 1 and 2). Samples were chipped out of cold storage at 40° F on January 13, and thereafter on January 27, February 3, and February 10 at 70° F. At both locations, ND7176-18 chipped as light or lighter than Norchip and Monona. Line ND7103-4 also produced light colored chips. Certain selections and varieties would chip light at a particular location and after a period of reconditioning. However, in general the chip color and quality of many samples was not consistent from sample to sample. This is what makes it difficult in determining whether one selection or variety is any better in chip quality. Norchip and Monona seem to be slightly lighter in color than Platte or Shurchip, but much lighter than Cobbler or Kennebec and some of the advanced selections seem again to have better quality than all the named varieties. If a new variety is released it must be as good or better than the named varieties and should have at least one characteristic better than the named variety.

Culinary Tests. Boiling and baking tests were again conducted on fifteen named varieties and ten advanced selections. This test has its limitation, however, it showed that ND6925-13 Russ had exceptionally good baking and boiling quality and that several advanced selections were as good or better in culinary quality as many of the named varieties. Varieties that had good culinary quality were Norgold Russet and Norchip. Varieties and selections with high total solids showed the most sloughing. Several of the unnamed selections were very white in color immediately after cooking and after being exposed to air at room temperature for four hours. Results of this test are shown in North Dakota Tables 3 and 4.

Variety Trials. Replicated variety trials were again planted at Grand Forks, Park River, Minot, Williston, and Carrington (dry land and irrigation). The trials at Williston and Minot were under the supervision of Ernest French and Ben Hoag. Howard Olson and Francis Sobolik were in charge of the Carrington trial, while at Park River, Wayne Grinde and Gerald Huebner were in charge. At Grand Forks Don Uhler was in charge of general care and maintenance.

The variety trial consisted of 25 hills replicated four times in a randomized block. Twenty-three varieties and selections were grown in the Grand Forks and Park River trial, while 18 entries were grown in the Carrington trials. Sixteen entries were grown in trial at Minot and Williston.

Spacing, fertilizer, soil type, planting and harvest dates of each location were as follows.

Location	Spacing		Fertilizer	Soil Type	Planting	Harvest
	Row	Plant			Date	Date
Grand Forks	38"	12"	400#/A 20-20-10	Bearden Clay Loam	5/10	9/20
Park River	36"	12"	420#/A 20-20-10	Glyndon Salt Loam	5/4	9/16
Minot	42"	14"	13+58-0	Williams Loam	5/13	9/21
Williston	38"	15"	100#/A 18-46-0	Loam	5/19	9/21
Carrington (Dry)	36"	9"	300#/A 17-17-17	Kief Loam	5/3	9/21
Carrington (Irr.)	36"	12"	300#/A 17-17-17	Kief Loam	5/3	9/20

1971 was again a good year for Potato Production. The plots were planted very early in the spring (May 3 at Park River and May 4 at Carrington). This probably was the earliest the plots have been planted for at least ten years. It was generally quite dry at planting time but by the middle of May and later moisture was plentiful. In Eastern North Dakota rainfall was sufficient except for the month of August which was very dry. In Eastern North Dakota temperatures were ideal being generally in the 70's and 80's, and no extreme high temperatures occurred during the growing season. Almost a similar situation occurred in Western North Dakota where temperatures and rainfall were normal except for the month of August. At Williston, August was the hottest and driest month on record. Severe hail damage occurred in Western North Dakota during July. September was an ideal month at all locations, being quite cool and moist.

Kennebec, Red Pontiac, Norchip and Viking were the highest yielding varieties. Chieftain and ND7196-18 also produced a good yield (North Dakota Table 5). Kennebec had an average of 325 cwt. per acre when tested at all locations followed by Red Pontiac with 301 cwt. per acre.

When grown in trials at only Grand Forks and Park River, the late maturing red selection ND6719-36R, produced some very high yields. Again the disadvantage of this selection is its lateness and susceptibility to air cracking. Although the yields of ND7103-4 were not quite comparable to Norchip this selection did produce some smooth, nice appearing tubers. Line ND7102-4 also has excellent chip quality. The tubers of ND6925-13 Russ were somewhat on the small size but this selection produced some smooth beautiful russet tubers. Line ND6993-13 Russ produced fairly good total yields, but the amount of growth cracking in this particular selection reduced the U.S. No. 1 yield. Line ND6634-2R did not produce good yields at certain locations this year because badly diseased seed was planted. Line ND7642-3 Russ produced fair to medium yields of beautiful netted tubers.

In spite of the fact that only two applications of irrigation water were needed during the season at Carrington, varieties in the irrigated trial yielded an average of 197 cwt. more per acre than the dryland trial. Two acre inches of water were applied in each of the two irrigations.

Norchip again produced the highest specific gravity of all varieties grown at all locations (North Dakota Table 6). Other varieties producing high specific gravity were: Russet Burbank, ND6993-13 Russ, Kennebec, ND7196-18, ND6925-13 Russ, and Cobbler. Red Pontiac and Norland once again produced the lowest specific gravity.

In the four trials in Eastern North Dakota the selection ND7103-4 produced an average of 1.090 specific gravity. Line ND7761-3 Russ also produced high specific gravity when grown at Grand Forks and Park River.

In general, varieties at most locations produced high specific gravity. The specific gravity of entries in trial at Grand Forks, Park River and Minot averaged above 1.080. The trial at Minot had an average of all entries of 1.092.

Probably the most striking difference in specific gravity was comparing the irrigated and dryland trials at Carrington where entries in the dry land averaged 1.093 and in the irrigated trial 1.077. Again this difference in specific gravity resulted in putting on only two applications of irrigation water. However, this must have been just enough water to keep the soil cool and moist and lower the specific gravity.

DISEASE TESTING

In 1971, 629 tubers from 247 parent selections, 432 tubers from 180 second year selections, 68 tubers from 17 third year selections, 252 tubers from 63 fourth year selections, 782 tubers from 30 large increase selections and 624 seedling selections were tested for PSTV and PVX. On a selection basis, 10.5 percent of the parents, 18.3 percent of the second year selections, 29.4 percent of the third year, 38.0 percent of the fourth year, 43.1 percent of the large increase, and 10.8 percent of the seedling selections were infected with PSTV. In all cases except large increase, PVX was of less importance. Less than one percent of the seedlings, while over 40 percent of the large increase selections had some degree of PVX infection. Two indexing changes are planned for 1972. These changes are incorporation of Scopolia sinensis for bio assay and the Florida test (with numbering each tuber for identification).

Twelve advanced selections were evaluated for PSTV, PVX, verticillium wilt, and late blight resistance. Table 7 shows the results of this evaluated.

Scab and silver scurf resistance was evaluated in all selections; scurf evaluations were made at harvest and again after storage. The results are tabulated in Table 8.

North Dakota Table 1. 1971 Chip Tests of Varieties and Selections Grown
at Grand Forks, North Dakota During 1970

	January 13			January 20			February 3			February 10		
	Color Chart	Yield	Color Chart	1/ Chart	Photo volt	2/ Yield	Color Chart	Photo volt	3/ Yield	Color Chart	Photo volt	Yield
Cobbler	8.8	35.5	7.8	7.8	20.6	37.3	8.0	16.3	32.5	8.5	29.5	35.0
Kennebunc	10.0	33.8	6.3	6.3	25.6	38.3	8.0	18.6	35.0	7.5	20.4	34.3
McNona	7.8	40.5	4.5	4.5	31.8	36.5	5.8	25.3	35.0	4.8	34.0	33.0
Norchip	9.0	36.8	6.5	6.5	24.5	36.0	6.5	27.0	35.8	4.5	32.4	36.3
Platte	9.3	35.0	8.8	8.8	14.6	37.3	8.3	16.1	33.5	7.0	25.3	32.0
Shurchip	11.0	36.8	7.5	7.5	27.0	36.8	8.5	16.4	35.3	6.5	25.3	37.8
5922-12	11.0	34.0	9.0	9.0	14.6	34.0	8.8	12.5	33.8	9.0	15.9	34.5
6925-13Russ	11.0	35.5	9.3	9.3	10.3	35.8	9.8	14.5	35.3	9.8	10.8	36.3
6993-13Russ	9.5	37.0	6.8	6.8	16.5	38.8	8.0	20.0	34.3	5.0	29.5	37.0
7097-2	11.0	39.5	8.5	8.5	16.6	37.5	8.5	20.3	35.3	8.3	23.2	36.8
7103-4	11.0	34.0	7.5	7.5	21.1	39.3	7.0	19.4	36.5	5.0	29.5	36.0
7196-13	8.3	35.5	6.3	6.3	21.0	39.3	6.3	27.5	34.0	4.8	31.5	34.0
7233-9Russ	11.0	31.8	11.0	11.0	12.2	35.6	11.0	12.3	31.0	9.3	14.9	34.2
7642-3Russ	9.5	32.0	10.0	10.0	11.2	35.3	9.0	16.3	32.0	8.5	20.0	35.3
Peconic	10.0	3.6	8.8	8.8	17.3	36.0	7.8	17.0	35.8	7.8	20.8	36.3
Jewel	11.0	3.5	6.8	6.8	18.9	41.3	7.3	28.8	36.3	7.3	23.3	37.0

1/ Color Chart - standard color chart (1 light 11 dark).

2/ Photovolt - higher numbers are lighter in color.

3/ Yield - percent chip yield.

North Dakota Table 2. 1971 Chip tests of varieties and selections grown at Park River, North Dakota during 1970.

January 13			January 27			February 3			February 10		
Color Chart	Yield	Color Chart ₁	Photo volt ₂	Yield ₃	Color Chart	Photo volt	% Yield	Color Chart	Photo volt	% Yield	
Cobbler	8.8	37.5	6.3	23.6	37.0	6.3	22.9	36.3	5.5	24.9	36.3
Kennebec	9.0	34.8	5.0	26.9	36.3	5.8	29.5	34.0	4.8	32.5	34.0
Monona	7.3	36.8	4.0	30.1	37.3	3.8	34.3	36.0	4.5	31.0	34.0
Norchip	8.3	38.8	4.5	31.6	35.8	4.0	34.0	37.5	4.5	33.8	35.5
Platte	8.0	35.3	5.5	28.7	34.8	4.8	34.2	34.0	6.3	27.1	31.5
Shurchip	9.5	34.0	5.8	35.0	37.3	3.8	29.5	37.8	5.5	34.2	35.5
5922-12	9.3	37.5	7.0	21.3	37.0	4.8	31.1	36.8	5.8	30.9	36.0
6925-13Russ	9.0	37.8	7.8	17.9	37.8	7.5	23.9	35.0	7.0	25.4	36.5
6993-13Russ	9.5	37.0	5.8	28.1	39.5	5.0	33.5	36.5	5.0	30.9	33.8
7097-2	7.5	38.0	7.0	25.6	38.8	4.8	35.6	38.5	4.8	34.5	35.5
7103-4	8.3	37.0	6.3	28.6	38.0	4.8	29.0	37.0	4.5	28.4	34.5
7196.18	8.3	35.0	3.5	35.1	37.0	3.5	35.3	37.8	3.5	38.8	33.8
7233-9Russ	11.0	34.0	10.0	13.9	34.5	10.8	11.6	34.3	10.0	12.5	32.5
7642-3Russ	9.0	33.0	7.5	18.2	35.5	8.8	20.8	34.5	7.3	22.4	35.5

1/ Color Chart - standard color chart (1 light 11 dark).

2/ Photovolt - higher numbers are lighter in color.

3/ Yield - percent chip yield

North Dakota Table 3. 1971 Cooking tests of varieties and selections grown at Grand Forks, North Dakota during 1970.

	Boiling			Baking					
	Slough-1/ ing	Meali-2/ ness	Texture ³ / Cooking	Color ⁴ / After Cooking	Color ⁵ / 4 hrs. After Cooking	Meali- ness	Texture	Color	Flavor ⁶ / Flavor
Chieftain	7.5	8.0	8.0	8.8	8.5	8.3	7.8	9.3	8.5
Cobbler	7.0	8.3	8.5	7.8	7.5	3.3	8.5	8.3	8.8
Kennebec	9.0	9.0	8.5	7.5	8.3	9.0	8.5	8.5	9.0
LaRouge	7.3	7.3	7.0	7.0	5.3	7.3	7.3	8.0	6.3
Norchief	8.0	8.3	8.3	8.8	8.3	8.5	8.3	9.3	9.0
Norchip	8.5	9.0	8.8	9.3	9.0	8.3	8.8	8.8	9.0
Monera	8.0	8.5	8.8	8.8	8.5	7.0	7.5	8.0	8.5
Norgold	8.5	9.5	9.0	9.8	9.0	9.3	9.0	9.8	9.0
Norland	8.0	7.8	8.0	8.8	7.5	8.3	8.5	9.0	9.0
Platte	8.8	9.0	8.5	9.0	3.5	8.3	8.5	8.8	9.0
Raritan	9.0	9.3	9.3	8.5	7.8	8.8	9.0	9.0	8.8
Red Pontiac	8.0	7.5	7.3	9.0	8.8	7.0	7.0	7.8	8.0
Russet Burbank	7.8	8.5	8.8	7.8	7.8	8.3	8.0	7.5	8.5
Shurchip	8.5	9.0	8.5	9.3	8.5	9.0	9.0	9.5	8.8
Viking	7.8	7.0	7.5	9.5	8.8	7.0	8.0	8.8	8.8
5922-12	8.0	8.0	8.3	8.0	8.0	8.3	8.3	8.5	8.5
6634-2R	7.8	7.8	7.5	8.0	6.5	7.0	7.5	8.5	8.3
6925-13 Russ	9.0	9.5	9.3	10.0	9.8	9.0	8.8	9.5	9.3
6993-13 Russ	8.5	9.3	9.0	9.0	8.8	9.5	9.3	8.5	9.0
7003-2 Russ	6.8	6.8	6.8	8.5	8.5	7.0	6.0	7.5	7.8
7097-2	8.5	9.0	8.5	9.0	8.3	8.5	8.5	8.8	8.8
7103-4	8.5	9.5	8.3	9.3	8.5	9.0	9.0	9.3	8.8
7196-18	9.0	9.0	8.0	9.5	9.0	8.5	8.8	8.5	8.3
7233-9 Russ	7.8	7.8	7.8	8.3	8.0	8.3	8.5	8.5	8.3
7642-3 Russ	8.8	8.5	7.8	8.8	8.3	8.5	8.5	9.0	9.3

1/ 1 severe sloughing, 10 no sloughing; 2/ 1 not mealy, 10 very dry and mealy; 3/ 1 poor texture, 10 good texture.
4/ 1 dark color, 10 very white color; 5/ 1 dark color, 10 very white color; 6/ 1 poor flavor, 10 good flavor.

North Dakota Table 4. 1971 Cooking Tests of Varieties and Selections Grown at Park River, North Dakota During 1970.

	Boiling			Baking					
	Slough- <u>1</u> / ing	Meali- <u>2</u> / ness	Texture <u>3</u> / Cooking	Color <u>4</u> / After Cooking	Color <u>5</u> / 4 hrs. After Cooking	Meali- ness	Texture	Color	Flavor <u>6</u> / Flavor
Chieftian	7.8	8.3	8.3	9.0	7.3	7.8	7.8	9.3	8.3
Cobbler	7.8	8.5	8.8	8.0	7.5	8.0	8.0	7.0	8.0
Kennebec	7.8	9.0	8.8	8.8	8.3	8.8	8.8	8.8	8.8
LaRouge	6.5	7.0	7.3	8.0	6.3	7.0	7.3	8.3	8.0
Norchief	8.0	8.3	8.0	9.5	9.0	8.5	8.3	9.0	9.0
Norchip	8.8	8.8	8.8	9.0	8.5	9.0	9.3	9.0	9.3
Monona	8.5	8.5	8.0	8.8	8.5	7.8	8.0	8.0	8.5
Norgold	9.3	9.3	9.0	10.0	9.5	9.0	9.3	9.0	9.3
Norland	8.3	7.3	8.0	8.3	7.0	8.0	8.0	8.5	9.0
Platte	8.5	8.3	7.5	8.3	6.5	8.5	8.5	8.5	9.0
Red Pontiac	7.3	7.0	7.3	9.5	8.8	7.0	7.8	8.3	8.3
Russet Burbank	8.5	8.3	8.5	8.5	8.3	8.3	8.0	8.0	9.0
Shurchip	8.3	8.8	8.5	9.0	8.3	9.0	8.3	8.3	8.3
Viking	8.3	8.0	8.0	10.0	9.3	7.3	7.8	8.3	8.8
5922-12	7.8	8.0	8.3	8.0	7.5	8.3	7.8	7.8	8.3
6634-2R	6.8	6.8	7.3	7.5	7.5	6.8	7.0	7.3	8.3
6925-13 Russ	8.0	9.0	9.3	9.8	9.0	9.0	8.5	8.5	9.0
6993-13 Russ	8.5	9.3	9.0	9.3	9.3	9.0	8.0	8.0	9.0
7003-2 Russ	6.8	7.8	7.8	9.0	8.5	6.3	6.8	7.8	8.0
7097-2	8.3	8.8	8.3	9.8	9.0	8.5	8.5	8.8	9.0
7103-4	8.5	8.5	8.5	9.5	8.8	8.8	8.8	9.0	8.5
7196-18	8.5	8.8	8.3	8.8	8.3	8.3	8.8	8.5	8.5
7233-9 Russ	7.3	7.0	7.5	8.8	8.0	7.3	7.5	8.0	8.0
7642-3 Russ	8.5	8.5	8.3	9.0	8.8	8.3	8.3	8.3	8.3

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1/ 1 severe sloughing, 10 no sloughing.
2/ 1 not mealy, 10 very dry and mealy.
3/ 1 poor texture, 10 good texture
4/ 1 dark color, 10 very white color
5/ 1 dark color, 10 very white color.
6/ 1 poor flavor, 10 good flavor.

North Dakota Table 5. Marketable Yield and Percent United States No. 1 of Varieties and Selections Grown in State-Wide Potato Trials, 1971.

	Park River			Grand Forks			Carrington			Minot			Williston		
	cwt/A	% US No. 1		cwt/A	% US No. 1		Dryland cwt/A	% US No. 1	Irrig. cwt/A	% US No. 1	cwt/A	% US No. 1	cwt/A	% US No. 1	Average cwt/A
Kennebec	340	94		310	93		467	92	512	97	192	95	126	89	305
Red Pontiac	415	92		291	95		255	95	547	97	186	88	114	93	301
Norchip	317	84		287	94		200	86	450	95	150	86	98	83	250
Viking	283	79		261	86		246	96	435	98	161	96	106	92	249
Chieftain	308	88		281	95		195	86	430	94	163	90	101	81	246
ND7196-18	280	88		258	90		224	84	402	92	153	81	102	78	237
Monona	276	95		218	98		201	93	431	98	146	94	103	91	229
Norland	326	91		201	92		211	87	372	95	152	89	96	85	226
Norgold Russet	323	92		213	88		177	85	385	93	135	85	97	91	222
Cobbler	241	87		182	87		226	89	445	95	122	86	98	85	219
Norchief	178	79		228	89		173	78	360	92	145	82	105	79	198
Russet Burbank	260	81		179	81		134	72	382	94	130	80	57	74	190
ND6925-13 Russ	261	83		183	84		158	77	342	91	82	63	67	76	182
ND7642-3 Russ	252	90		179	88		164	85	324	93	100	76	63	73	180
ND6993-13 Russ	189	70		122	75		151	85	291	94	104	79	62	76	153
ND6634-2R	166	71		147	85		105	70	307	90	94	80	73	82	149
ND6719-36R	359	86		277	88		274	93	567	98					369
ND7103-4	290	93		209	96		207	90	330	94					259
ND7688-3K	291	86		175	87										233
ND7761-33 Russ	251	86		176	81										214
ND6647-1R	233	87		166	87										200
ND7824-1R	223	84		144	84										184
ND7755-3 Russ	207	77		149	79										178
Average	261	82		202	84		209	86	406	94	123	84	82	83	

North Dakota Table 6. Specific Gravity^{1/} of Varieties and Selections Grown
In State-Wide Potato Trials, 1971.

	<u>Park River</u>	<u>Grand Forks</u>	<u>Carrington</u>		<u>Minot</u>	<u>Willi- ston</u>	<u>Average</u>
			<u>Dry- land</u>	<u>Irri- gation</u>			
Norchip	89	98	101	79	88	97	92
Russet Burbank	86	94	101	83	84	95	91
ND6993-13 Russ	88	95	90	82	87	96	90
Kennebec	86	90	102	78	85	96	90
ND7196-18	88	91	99	77	83	98	90
ND6925-13 Russ	86	95	94	78	85	94	89
Cobbler	83	85	97	80	88	96	88
Norchief	88	86	92	79	81	93	86
Norgold Russet	88	86	93	79	82	89	86
Viking	81	83	95	76	78	90	84
ND7642-3 Russ	85	87	87	74	77	90	83
Monona	82	87	92	69	79	91	83
ND6634-2R	82	85	86	74	78	87	82
Chieftain	78	84	89	76	74	89	82
Norland	79	80	89	74	73	86	80
Red Pontiac	81	83	84	71	73	83	79
ND7103-4	85	98	99	78			90
ND7619-36R	78	84	86	72			80
ND7761-33 Russ	86	94					90
ND7824-1R	85	93					89
ND6647-1R	84	88					86
ND7755-3 Russ	80	88					84
ND7688-3R	79	85					82
Average	80	85	93	77	81	92	

^{1/} 1.0 omitted from specific gravity readings.

North Dakota Table 7. Disease reactions of promising potato selections for 1971, Fargo.

Selection	Virus Assay		Late Blight	Verticillium Wilt
	PSTV	PVX		
5922-12	S	S	S	?
6634-2R	S	S	S	S
6647-1R	S	R	S	R
6925-13 Russ	VS	S	S	S
6993-13 Russ	VS	S	S	S
7003-2 Russ	S	S	?-0	S
7103-4	S	S	S	S
7196-18	VS	S	R-0	S
7218-22R	?	S	S	S
7642-3 Russ	?	S	S	S
7710-5	?	S	S	S
8104-3R	S	?	S	?

S - Susceptible

VS - Very susceptible

R - Resistant

? - Little or no reaction, possible resistance

0 - Race 0, Phytophthora infestans

North Dakota Table 8. Scab, silver scurf, and spindle tuber field symptoms of promising potato selections for 1971.

Selection No.	Scab ^{1/}			Silver Scurf ^{2/}		PSTV ^{3/}	
	Area	Type	G.R.	Harvest	Storage	Field	Assay
5922-12	2	2	1	5	4	-	2/6
6634-2R	1	2	3	4	1	-	2/26
6647-1R	1	2	2	4	1	-	1/26
6925-13 Russ	0	0	5	5	5	-	2/4
6993-13 Russ	1	1	4	5	5	-	2/21
7003-2 Russ	1	1	3	5	4	+	0/4
7103-4	3	1	2	5	4	-	6/52
7196-18	2	1	3	5	4	+	0/27
7218-22R	1	1	4	4	1	-	0/25
7233-9 Russ	1	1	4	5	5	-	0/4
7642-3 Russ	1	1	4	5	4	-	0/27
7710-5	2	1	3	5	3	+	0/6
8104-3R	2	1	3	2	n.t.	+	3/6
Norchip	1	2	2	5	3	-	0
Norgold	1	1	4	5	5	-	0/4
Norland	T	1	3	4	1	-	0
Viking	1	3	2	4	1	+	0
Pontiac	T	3	3	3	n.t.	-	0
Kennebec	1	3	3	5	n.t.	-	5/12
Cobbler	1	3	3	4	n.t.	-	0
Shishone	1	1	4	5	n.t.	+	0
USDA 41956	2	2	2	5	n.t.	-	0

- 1/ Scab - Area: percent of tuber covered with scab.
T = trace; 1,2,3,4,5, = 20,40,60,80,100% covered.
Type: 1 = surface, 2 = large, 3 = raised, 4 = pitted, 5 = deep pit.
Gen: General scab or silver scurf loading.
5 = apparent resistance, 4 = resistant, 3 = moderate resistance,
2 = susceptible; 1 = highly susceptible.
- 2/ Silver scurf general rating same as for scab general rating, only in terms of scurf.
Harvest: evaluated at harvest.
Storage: evaluated after storage, May 27, 1971.
n.t.: No tubers.
- 3/ PSTV - Potato spindle tuber virus
Field - evaluated at harvest from scab plot.
Assay - from tomato test, numerator - number of tubers infected with PSTV; denominator - number of tubers assayed; 0 - not tested.

OHIO

E. C. Wittmeyer and Floyd Lower

POTATO VARIETY TRIALS

The work was done under a cooperative arrangement between the Department of Horticulture of the Ohio Agricultural Research and Development Center, the Ohio State University, and the Ohio Potato Growers Association and local growers.

Thirteen varieties were each replicated two or more times on each of six farms in different sections of Ohio, except that the seed for five varieties was not on hand when farm one was planted and for one variety when farm two was planted. Additional replicates of the missing varieties were planted on the other farms.

Each plot consisted of two rows, in each of which 50 seedpieces were planted. Seed spacing varied from 9 to 11 inches in the row and 32 to 34 inches between. Each grower followed his usual field practices in planting, fertilization, culture, and spraying. Planting dates varied from April 28 to May 22. The seed was cut shortly before planting in each case and was dusted with polyram.

Fertilizer practices varied somewhat but were generally an equivalent to about 1000 to 1400 pounds of 10-20-20 per acre with additional nitrogen plowed down on two of the six farms. Herbicides and systemic insecticides were used on all of the farms. Farm one had a sandy loam while the other five farms had various types of silt loam.

Temperatures in the growing season were about normal, possibly slightly below average. There were no prolonged extremely hot periods as has occurred in some years. Rainfall was adequate in May except on farms four and five. It was generally rather light in June and particularly deficient on farms two and five. It was quite deficient on farm five in July and August and on farms two and four in August. Farms one and five suffered the most from lack of rainfall. On farm two the rainfall was deficient in June with a heavy rainfall in July and consequently had more than the normal number of misshapen tubers. Farm three had too much rainfall and was harvested in the mud. It could not be graded and is omitted in the tables.

Superior and Katahdin were used as standard varieties with which to compare the new varieties. The percentage of seedpieces that grew were about average, varying from 75% to 90% with an average of 85%. Very little virus disease of any kind was present in any of the varieties. Vigor was generally good and in most cases very good. A small amount of Verticillium and/or Fusarium wilt was found in a few lots but not to any great extent. Peconic showed a slight amount of scab in the plots when harvested.

A 50-pound sample of each variety was graded on a 1-7/8 inch screen to determine the percentage of size B with cull tubers discarded to determine the

marketable grade. The term "Marketable grade" would nearly meet the requirements of US #1. Specific gravity and chip tests were made at Ohio State University by Doctor Wilbur A. Gould.

Table No. 1 summarizes the data for all replicates of all farms by varieties, listed in order of maturity. Table No. 2 gives the yields of marketable potatoes, in Cwt per acre, by farm and by average of all farms for 1971, listed in order of average yield for each farm and average of all farms. NY 41 is a seedling about to be named. New Haig is a strain of Haig which is said to be slightly later and to have a lighter set. MS 503 is a promising seedling from Michigan.

OHIO TABLE 1. SUMMARY OF AVERAGE DATA FOR FIVE FARMS - 1971
(Listed in order of maturity. Nearest even whole number for marketable yields)

VARIETY	PERCENT OF PERFECT STAND	WEIGHT OF 40 TUBERS LBS.	PERCENT SIZE B	PERCENT CULLS	MAJOR DEFECTS <u>1</u> /	PERCENT MARKETABLE	MKT. YIELDS CWT./A
Alamo	82	11.6	6.2	14.8	ShGr	79.0	277
New Haig	84	14.7	5.6	4.6	CrSh	89.6	310
Superior	87	17.1	3.4	10.2	Sh	86.4	275
Monona	83	19.5	2.0	9.8	Sh	88.4	300
Wauseon	84	17.6	3.4	12.0	ShGr	84.6	270
Iopride	90	15.4	9.2	10.2	ShGr	80.4	302
Abnaki	84	20.4	2.2	11.0	Sh	86.9	319
Shurchip	89	14.3	5.4	8.0	Sh	86.6	335
Norchip	89	14.7	8.6	17.6	ShCrGr	73.8	294
M S 503	75	15.9	7.6	9.2	ShGr	83.2	276
N Y 41	79	21.4	2.0	8.8	Sh	89.4	347
Peconic	89	14.7	6.4	8.6	ScShGr	85.0	290
Katahdin	85	17.7	4.0	6.0	Gr	90.2	285
Average of all	85	16.5	5.1	10.0		84.9	298

1 / SH - Misshapen tubers, CR - Growth cracks, GR - Sun green or sunburn, SC - Scab

OHIO TABLE 2. YIELDS OF MARKETABLE POTATOES, IN CWT. PER ACRE, - 1971

By Farm and by Average of All Farms						
(Average of Replicates on each Farm)						
(Listed in order of average yield for each farm, using nearest even Cwt.)						
Farm No. 1	Farm No. 2	Farm No. 4	Farm No. 5	Farm No. 6	Average of 5 farms	
Shurchip 245	Peconic 451	N Y 41 418	Shurchip 247	N Y 41 404	N Y 347	
Ioprde 210	Katahdin 414	New Haig* 405	Katahdin 237	Shurchip 394	Shurchip 335	
New Haig 189	Shurchip 405	Shurchip 383	Abnaki 233	Norchip 335	Abnaki 319	
Superior 188	New Haig* 401	M S 503 376	Alamo 223	New Haig* 334	New Haig 310	
Norchip 172	Monona 401	Peconic 374	New Haig* 220	Superior 323	Ioprde 302	
M S 503 170	Ioprde 399	Ioprde 371	N Y 41 220	Ioprde 315	Monona 300	
Peconic 166	Abnaki 391	Norchip 363	Ioprde 216	Abnaki 312	Norchip 294	
Katahdin 142	Superior 363	Abnaki 342	Superior 212	Katahdin 300	Peconic 290	
(No Alamo, Monona, Wauseon, Abnaki, and N Y 41)	M S 503 358	Alamo 334	Peconic 203	M S 503* 289	Katahdin 285	
	Norchip 329	Katahdin 332	Monona 198	Alamo 288	Alamo 277	
	Wauseon 322	Monona 321	Norchip 194	Wauseon 281	M S 503 276	
	Alamo 263	Wauseon 308	M S 503 184	Monona 280	Superior 275	
	(No N Y 41)	Superior 287	Wauseon 171	Peconic 256	Wauseon 270	
Average 186	375	355	212	318	298	

* One replicate only

PENNSYLVANIA

Clarence S. Bryner

Extension Trials

In 1971 Extension variety demonstrations were conducted in cooperation with county extension agents and potato growers in the following counties and regions: Butler county, northwestern region; Potter county, north central region; Somerset county, southwestern region; York county, southeastern region; and Schuylkill and Lehigh counties, east central region. Ten varieties and four seedlings were evaluated for yield and specific gravity at five locations. Eight varieties and two seedlings were evaluated at one location.

Cultural Information

<u>County</u>	<u>Grower</u>	<u>Planting Date</u>	<u>Harvest Date</u>
Butler	Griffin Brothers	5/19	10/5
Lehigh	Willard Hamm	4/27	9/29
Potter	Ferd Irish	5/27	9/29
Schuylkill	Eugene Dresher	4/30	10/1
Somerset	Rich & Tom Croner	5/18	10/11
York	Don & Geo. Smith	4/16	9/23

All demonstrations were planted as randomized blocks with four replications. Seed pieces of each variety were hand planted in single 25-foot row plots, 9 inches apart within the row. Rows were 34 to 36 inches apart. Seed pieces of Norland were planted in 5-foot breaks between plots to identify the plots at harvest time. Total yields were recorded at harvest and tubers were graded for size over 1-7/8 inches.

Fertilizer applications at each location were made on the basis of soil test results obtained from the University Soil Testing Laboratory.

The fertilizer applications were:

<u>County</u>	<u>Plow Down</u>	<u>Row</u>
Butler	1000 lbs. 10-0-20	500 lbs. 12-12-12
Lehigh	10 tons manure	800 lbs. 16-8-8
Potter		750 lbs. 16-8-8
Schuylkill	1500 lbs. 10-10-10	800 lbs. 10-10-10 ^{1/}
Somerset	740 lbs. 10-10-10	400 lbs. 15-15-15
York		1000 lbs. 15-5-5

^{1/} In excess of recommendations

Specific Gravity and Dry Matter

Specific gravity was determined by the air-and-water method. Single varietal samples composited from four replications were taken at each location for the determinations.

Pennsylvania Tables Percent stand, total yield, percent and yield 1-7/8 inch or larger and specific gravity of potato varieties grown at locations in Pennsylvania--1971

Variety	Average % Stand	Total CWT./A.	Yield 1-7/8" or larger %	CWT./A. 1/	Specific Gravity
<u>Lehigh Table 1.</u>					
Line 6RF-1	97	433	80	347 a	.0719
Cascade	97	412	83	341 ab	.0780
Penn 71 (6HS-9)	97	372	90	334 ab	.0758
Abnaki	97	343	94	323 abc	.0756
Kennebec	95	347	91	315 abc	.0792
Norchief	95	397	78	310 abc	.0733
Katahdin	97	328	92	300 abc	.0719
Line 6CX-6	98	349	84	294 bcd	.0800
Superior	98	311	93	288 bcde	.0758
Shurchip	98	341	84	288 bcde	.0699
Peconic	98	338	80	271 cde	.0767
Monona	95	315	84	264 cde	.0674
Norchip	97	312	75	235 de	.0771
Line B5141-6	97	292	79	231 e	.1036
Average	97	350	85	296	1.0769
<u>Potter Table 2.</u>					
Line 6RF-1	98	346	99	342 a	.0796
Cascade	98	301	98	295 b	.0812
Kennebec	92	286	99	283 bc	.0823
Peconic	97	286	99	283 bc	.0882
Penn 71 (6HS-9)	92	282	99	279 bcd	.0779
Abnaki	98	283	98	277 bcd	.0817
Line 6CX-6	96	272	98	267 bcde	.0882
Norchief	94	266	97	258 cde	.0797
Superior	99	260	99	257 cde	.0873
Norchip	94	258	97	250 cde	.0850
Shurchip	95	248	98	243 de	.0809
Katahdin	95	240	98	235 efg	.0719
Monona	96	213	97	207 fg	.0674
Line B5141-6	91	208	97	202 g	.0943
Average	95	268	98	263	1.0831
<u>Schuylkill Table 3.</u>					
Kennebec	98	394	92	362 a	.0675
Abnaki	100	367	94	346 ab	.0668
Penn 71 (6HS-9)	95	360	94	338 abc	.0658
Norchief	89	369	87	321 bcd	.0703
Line 6CX-6	98	341	90	307 cd	.0700
Line B5141-6	94	381	80	305 cd	.0851
Cascade	100	360	83	299 d	.0697
Katahdin	96	325	91	296 d	.0570
Peconic	98	337	87	293 d	.0731
Line 6RF-1	97	369	79	292 de	.0612
Norchip	98	320	80	256 ef	.0702
Monona	99	257	92	236 f	.0592
Shurchip	99	301	78	235 f	.0658
Superior	98	247	93	229 f	.0635
Average	97	338	87	294	1.0675

1/ CWT./A. yield (1-7/8" size or larger) followed by the same letter are not considered significantly different at the .05* level according to Duncan's (Bayesian modified) least significance difference test.

Pennsylvania Tables Percent stand, total yield, percent and yield 1-7/8 inch or larger and specific gravity of potato varieties grown at locations in Pennsylvania--1971

Variety	Average % Stand	Total CWT./A.	Yield 1-7/8" or larger %	CWT./A. 1/	Specific Gravity
<u>Somerset Table 4.</u>					
Cascade	98	485	95	459 a	.0731
Kennebec	98	475	97	459 a	.0701
Line 6CX-6	98	427	96	404 ab	.0764
Penn 71 (6HS-9)	92	423	96	404 ab	.0891
Line 6RF-1	98	427	92	392 abc	.0623
Superior	99	366	98	357 bcd	.0747
Norchief	86	378	93	353 bcd	.0735
Peconic	95	351	96	338 bcde	.0692
Katahdin	92	347	96	333 cdef	.0656
Shurchip	98	338	94	318 def	.0617
Monona	98	314	97	303 def	.0638
Line B5141-6	95	305	92	282 ef	.0861
Norchip	92	292	91	267 fg	.0723
Abnaki	98	212	96	203 g	.0700
Average	96	367	95	348	1.0720
<u>York Table 5.</u>					
Cascade	95	409	91	372 a	.0755
Kennebec	98	392	88	345 a	.0743
Penn 71 (6HS-9)	95	340	92	313 bc	.0703
Norchief	90	362	87	315 b	.0731
Superior	95	320	95	304 bcd	.0785
Abnaki	100	320	93	298 bcde	.0737
Line 6RF-1	97	387	75	291 bcde	.0711
Line 6CX-6	95	351	82	287 cde	.0804
Norchip	98	322	84	279 de	.0766
Line B5141-6	95	320	85	272 ef	.0956
Katahdin	87	274	91	249 fg	.0665
Shurchip	97	281	81	227 gh	.0696
Monona	95	244	91	223 gh	.0676
Peconic	91	258	84	217 h	.0748
Average	95	328	87	285	1.0748
<u>Five locations combined Table 6.</u>					
Cascade	98	393	90	353 A	1.0755 BC
Kennebec	97	379	93	353 A	1.0747 BC
Penn 71 (6HS-9)	94	355	94	334 AB	1.0756 BC
Line 6RF-1	97	392	85	333 AB	1.0692 EF
Line 6CX-6	97	348	90	312 ABC	1.0790 B
Norchief	91	354	88	312 ABC	1.0740 CD
Abnaki	99	305	95	289 BCD	1.0736 CDE
Superior	98	301	96	287 CD	1.0760 BC
Katahdin	93	303	93	282 CD	1.0677 EF
Peconic	96	314	89	280 CD	1.0764 BC
Shurchip	97	302	87	262 D	1.0696 DEF
Line B5141-6	94	301	86	258 D	1.0929 A
Norchip	96	303	85	257 D	1.0762 BC
Monona	97	269	92	247 D	1.0675 F

1/ CWT./A. yield (1-7/8" size or larger) Specific Gravity followed by the same letter are not considered significantly different at the .05* level according to Duncan's (Bayesian modified) least significance difference test.

Pennsylvania Tables Percent stand, total yield, percent and yield 1-7/8 inch or larger and specific gravity of potato varieties grown at locations in Pennsylvania--1971

Variety	Average % Stand	Total CWT./A.	Yield 1-7/8" or larger %	CWT./A. <u>1/</u>	Specific Gravity
<u>Butler Table 7.</u>					
Cascade	95	397	94	372 a	.0728
Line 6CX-6	98	391	94	366 ab	.0776
Penn 71 (6HS-9)	98	346	97	337 abc	.0743
Superior	97	344	97	334 abc	.0756
Kennbec	99	344	96	331 abc	.0782
Katahdin	98	343	96	331 abc	.0753
Abnaki	98	346	95	329 abc	.0755
Norchip <u>2/</u>	100	338	94	317 bc	.0793
Peconic	98	340	91	309 c	.0870
Monona	95	263	95	251 d	.0689
Average	<u>98</u>	<u>345</u>	<u>95</u>	<u>328</u>	<u>1.0764</u>

1/ CWT./A. yield (1-7/8" size or larger) followed by the same letter are not considered significantly different at the .05* level according to Duncan's (Bayesian modified) least significance difference test.

2/ Norchip averaged 12" spacing in row others 9".

PENNSYLVANIA

J. D. Harrington and R. B. Beelman

Potato variety trials were conducted at the Agronomy Research Farm at Rock Springs in Centre County (central) and at the Henry G. Shenk Farm near Manheim in Lancaster County (southeast) in 1971.

Soils at the experimental sites were deep, heavy, well-drained and near neutral pH. Prior to varietal hand-planting, rows were furrowed out three feet apart and simultaneously treated with systemic insecticide and commercial fertilizer. The Centre County site received N, P_2O_5 , and K_2O totaling 150-226-100 lb/A, and the Lancaster County site received 120-240-120 lb/A.

Seed for seventeen varieties and seedling numbers was Maine grown and obtained from either the United States Department of Agriculture or the Maine Department of Agriculture. Norchief seed was obtained from North Dakota and seed of Shurchip, 6HS9, 6CX6 and 6RF1 was Pennsylvania grown. Seedpieces (four-cut) were planted nine inches apart within 25-foot single row plots, with a three-foot break between plots. A randomized block design with four replications for each of the three maturity groups (early, medium, and late) was employed. Centre County seeding was April 7; that in Lancaster County was done on May 4.

Varieties were mechanically harvested with a "Braco" single-row harvester and bagger attachment on October 5 (161 days after planting) in Centre County and on October 4 (153 days after planting) in Lancaster County. Ample moisture was available in both Centre and Lancaster Counties. Average night and day temperatures were lower in Centre County than in Lancaster County.

Production and Quality Indices

Varietal maturity, tuber production, and tuber quality indices were obtained as follows:

Maturity - percent vegetative tops naturally dead 19 and 20 weeks after planting in Centre County and 16 and 19 weeks after planting in Lancaster County.

Percent stand - based on the total number of plants emerged seven to eight weeks after planting.

Total yield, cwt/A - tubers 1-1/2 inches in diameter and larger were harvested from plots, weighed, and total plot weights converted to hundredweight yields per acre.

Percent of total yield 1-7/8 to 4 inches in size and 2-1/4 to 4 inches in size - harvested tubers from each plot were graded and grouped into the two size distribution classes. Size A (round or intermediate varieties) included potatoes of 1-7/8 inches minimum in size with 60 percent or more 2-1/4 inches and larger.

Specific gravity - determined from approximately eight-pound tuber samples by the air-and-water method.

Percent total solids - values obtained directly from specific gravity readings by employing the conversion table reported by G. V. C. Houghland.

Chip yield, lb/100 lb - an estimate of the pounds of chips obtained from 100 pounds of raw peeled potatoes. Eight-ounce samples of peeled, washed 1/16-inch raw slices were fried to obtain chip yield.

Chip color, Rd - determined with the Gardner Color Difference Meter. Instrument was standardized against color standard C-LY-1047-57. Rd (reflectance) values 20.0 and above may be considered acceptable for marketing.

All tuber-quality indices were determined within four weeks after harvest at the Department of Horticulture's Food Processing Laboratory. Tubers were stored in dry barns until grading without facilities for control of temperature or humidity. Chip quality indices were determined approximately two weeks after storage at room conditions.

Centre County Trials (central)

Summarized highlights of the research results in Centre County were as follows:

The nine late-maturing varieties averaged highest in total yields per acre, 346 cwt, whereas the five medium- and eight early-maturing varieties averaged 315 and 244 cwt, respectively. Early-maturing varieties produced tubers highest in specific gravity, 1.084, and chips lightest in color, 23.0 Rd 28 days after harvest. Tuber specific gravity of medium- and late-maturing varieties was 1.081 and 1.078, whereas chip color was 21.0 and 21.1 Rd, respectively.

Highest total yields per acre of early-, medium-, and late-maturing varieties were obtained for Norchief (322 cwt), Cascade (359 cwt), and 6Rf1 (428 cwt). Lowest yields per acre were produced by B5698-8 (152 cwt), Wauseon (232 cwt), and Shurchip (266 cwt).

All varieties within each maturity group, except Norchief, Haig, Anoka, Norchip, and Shurchip, produced 60 percent or more of the total yield in 2-1/4-inch size or larger, thus meeting the minimum requirement for Size A potatoes.

Varieties with the highest percentage of the total yield 2-1/4 inches or larger in size for each maturity group were Seminole (80%), Keswick (89%), and Katahdin (83%). Varieties producing the lowest total yield 2-1/4 inches or larger in size were B5698-8 (1%), Norchip (48%), and Shurchip (58%).

Varieties showing high specific gravity and solids content produced high yields of chips. Varieties of low specific gravity produced fewer pounds of chips per 100 pounds of potatoes.

Highest specific gravity tubers for each maturity group were as follows: Seminole, 1.097; Norchip, 1.085; and Raritan, 1.093. Lowest specific gravity varieties were Monona, 1.076; Wauseon, 1.075; and 6Rf1, Katahdin, and Shurchip, 1.074. Of these eight varieties, Raritan, 6Rf1, and Shurchip did not produce chips of acceptable color.

Sixteen of the twenty-two varieties produced chips sufficiently light in color (20.0 Rd and higher) after harvest to be considered commercially acceptable.

Varieties which produced chips lightest in color for each maturity group were Monona, Wauseon, and 6HS9. Varieties which produced the darkest-colored chips were Norchief, Cascade, and Raritan.

Lancaster County Trials (southeast)

Summarized highlights of the research results in Lancaster County were as follows:

The five medium-maturing varieties averaged highest in total yields per acre, 349 cwt, whereas the nine late- and eight early-maturing varieties averaged 346 and 279 cwt, respectively. Medium- and late-maturing varieties produced tubers highest in specific gravity, 1.068, but late-maturing varieties produced chips lightest in color, 20.8 Rd 28 days after harvest. Tuber specific gravity of early-maturing varieties was 1.065. Chip color of early- and medium-maturing varieties was 18.8 and 18.3 Rd, respectively.

Highest total yields per acre of early-, medium-, and late-maturing varieties were obtained for Norchief (342 cwt), Cascade (543 cwt), and 6Rf1 (452 cwt). Lowest yields per acre were produced by B5698-8 (214 cwt), Abnaki (254 cwt), and Shurchip (296 cwt).

Of the twenty-two varieties, only six produced 60 percent or more of their total yield 2-1/4 inches or larger in size thus meeting the minimum requirement for Size A potatoes.

Varieties with the highest percentage of the total yield 2-1/4 inches or larger in size for each maturity group were Seminole (74%), Abnaki (77%), and Katahdin (70%). Varieties producing the lowest total yield 2-1/4 inches or larger in size were B5698-8 (4%), Norchip (37%), and 6CX6 (37%).

Varieties showing high specific gravity and solids content produced high yields of chips. Varieties of low specific gravity produced fewer pounds of chips per 100 pounds of potatoes.

Highest specific gravity tubers for each maturity group were as follows: Seminole, 1.078; Keswick, 1.074; and Raritan, 1.082. Lowest specific gravity varieties were Monona, 1.056; Wauseon, 1.058; and Katahdin, 1.061. Of these six varieties, Monona, Keswick, and Katahdin did not produce chips of acceptable color.

Twelve of the twenty-two varieties produced chips sufficiently light in color (20.0 Rd and higher) after harvest to be considered commercially acceptable.

Varieties which produced chips lightest in color for each maturity group were B5665-7, Wauseon, and Oromonte. Varieties which produced the darkest colored chips were Norchief, Cascade, and Katahdin.

Table 1. Potato variety trials in Pennsylvania, 1971.

VARIETY or SEEDLING	CENTRE COUNTY (central)									
	-----PRODUCTION INDICES-----					-----QUALITY & CHIP INDICES*-----				
	Origin	Stand, %	Total yield, cwt/A	% of yield, 1-7/8" 2-1/4" to 4" to 4"		Spec. grav.	Solids, %	Chip yld., lb/100 lb	Chip color, Rd	
<u>EARLY MATURITY</u>										
Norchief	N. D.	99	322	85	59	1.084	21.8	32.0	19.2	
Superior	Wis.	100	283	93	72	1.086	22.2	31.5	23.6	
B5665-7	USDA	95	272	91	67	1.086	22.2	32.3	24.6	
Monona	Pri. (F-L)	98	247	94	78	1.076	20.4	31.2	25.6	
Haig	Neb.	99	231	87	59	1.084	21.9	32.8	21.1	
Anoka	USDA, Minn.	99	222	87	54	1.083	21.7	31.1	22.1	
Seminole	Pri. (F-L)	99	222	95	80	1.097	24.3	33.2	24.8	
B5698-8	USDA	100	152	38	1	1.078	20.8	31.0	23.2	
L.S.D. (.05)		3	39	4	7	0.005	1.0	NS	NS	
C.V., %		1.9	10.8	3.1	7.7	0.3	3.0	5.7	12.0	
<u>MEDIUM MATURITY</u>										
Cascade	USDA, Wash.	99	359	88	64	1.084	21.8	32.0	18.7	
Abnaki	USDA, N. Y., Me.	99	343	95	84	1.079	20.9	31.6	21.0	
Keswick	CaDa	96	333	96	89	1.083	21.6	30.0	19.0	
Norchip	N. D.	99	306	82	48	1.085	22.1	33.2	21.6	
Wauseon	USDA, N. Y.	99	232	92	75	1.075	20.2	30.4	24.9	
L.S.D. (.05)		NS	31	3	8	0.007	1.2	2.0	NS	
C.V., %		2.1	6.5	2.3	7.0	0.4	3.6	4.2	17.5	

Table 1. (Continued)

VARIETY or SEEDLING	Origin	CENTRE COUNTY (central)		-----QUALITY & CHIP INDICES*-----						
		-----PRODUCTION INDICES-----								
		Stand, %	Total yield, cwt/A	% of yield, 1-7/8" 2-1/4" to 4" to 4"	Spec. grav.	Solids, %	Chip yld., lb/100 lb	Chip color, Rd		
<u>LATE MATURITY</u>										
6RF1	Pa.	96	428	90	72	1.074	20.0	29.0	18.8	
Kennebec	USDA	98	396	94	82	1.078	20.8	29.8	22.5	
6HS9	Pa.	98	361	94	79	1.076	20.4	29.8	23.2	
Raritan	CaDa, N. J.	99	352	93	75	1.093	23.6	33.6	17.1	
6CX6	Pa.	100	350	90	73	1.079	21.0	30.0	22.0	
Katahdin	USDA	97	347	95	83	1.074	20.0	29.9	22.4	
Oromonte	USDA, Colo.	94	328	89	67	1.076	20.4	31.0	22.0	
Peconic	N. Y.	98	288	89	66	1.079	21.0	32.4	22.7	
Shurchip	Neb.	98	266	86	58	1.074	20.0	32.0	19.6	
L.S.D. (.05)		NS	59	3	7	0.004	0.8	1.7	3.0	
C.V., %		2.9	11.8	2.2	6.5	0.3	2.8	3.8	9.7	

* Specific gravity determined 10/25; chipped 11/2, 28 days after harvest.

Table 1. (Continued)

VARIETY or SEEDLING	LANCASTER COUNTY (southeast)					----QUALITY & CHIP INDICES**----				
	-----PRODUCTION INDICES-----									
	Stand, %	Total yield, cwt/A	% of yield, 1-7/8" to 4"	2-1/4" to 4"		Spec. grav.	Solids, %	Chip yld., lb/100 lb	Chip color, Rd	
Origin										
<u>EARLY MATURITY</u>										
Norchief	N. D.	92	342	80	40	1.067	18.6	28.2	15.6	
B5665-7	USDA	92	307	77	35	1.072	19.6	29.2	21.2	
Superior	Wis.	99	300	91	63	1.064	18.2	27.4	16.0	
Haig	Neb.	96	286	83	47	1.060	17.3	28.2	20.0	
Anoka	USDA, Minn.	99	278	82	45	1.060	17.4	27.4	17.1	
Monona	Pri. (F-L)	98	263	86	44	1.056	16.6	26.3	19.7	
Seminole	Pri. (F-L)	98	240	93	74	1.078	20.8	30.8	20.3	
B5698-8	USDA	94	214	31	4	1.064	18.1	28.0	20.8	
L.S.D. (.05)		NS	45	5	10	0.004	0.7	1.9	3.1	
C.V., %		4.1	11.1	4.4	15.8	0.2	2.8	4.6	11.2	
<u>MEDIUM MATURITY</u>										
Cascade	USDA, Wash.	98	543	85	56	1.072	19.7	29.8	16.1	
Keswick	CaDa	94	334	91	74	1.074	20.0	28.3	16.8	
Norchip	N. D.	98	323	78	37	1.072	19.6	31.0	18.8	
Wauseon	USDA, N. Y.	100	290	85	56	1.058	17.1	27.1	22.2	
Abnaki	USDA, N. Y., Me.	95	254	94	77	1.066	18.4	28.3	17.6	
L.S.D. (.05)		4	57	5	11	0.003	0.7	2.1	3.6	
C.V., %		2.4	10.6	3.7	11.4	0.2	2.4	4.7	12.7	

Table 1. (Continued)

VARIETY or SEEDLING	Origin	LANCASTER COUNTY (southeast)				-----QUALITY & CHIP INDICES**-----			
		-----PRODUCTION INDICES-----							
		Stand, %	Total yield, cwt/A	% of yield,		Spec. grav.	Solids, %	Chip yld., lb/100 lb	Chip color, Rd
				1-7/8" to 4"	2-1/4" to 4"				
LATE MATURITY									
6RF1	Pa.	94	452	76	42	1.064	18.1	26.7	21.2
Kennebec	USDA	98	428	87	61	1.065	18.3	27.6	21.7
Katahdin	USDA	92	333	92	70	1.061	17.6	27.9	18.2
6HS9	Pa.	95	326	85	52	1.068	18.8	28.6	21.4
Oromonte	USDA, Colo.	92	326	78	45	1.066	18.6	31.0	22.9
Peconic	N. Y.	98	322	80	42	1.072	19.6	29.2	21.1
Raritan	CaDA, N. J.	100	316	87	54	1.082	21.4	32.7	20.0
6CX6	Pa.	98	313	77	37	1.071	19.4	28.8	22.1
Shurchip	Neb.	94	296	81	41	1.063	17.9	30.2	18.4
L.S.D. (.05)		6	47	4	7	0.004	0.8	1.4	NS
C.V., %		4.0	9.3	3.7	10.1	0.3	2.9	3.3	10.2

** Specific gravity determined 10/26; chipped 11/1, 28 days after harvest.

SOUTH CAROLINA

Wayne Sitterly

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Irish Potato Variety Trials

Purpose. The purpose of this test is to obtain varieties suitable to coastal South Carolina.

Procedure. A field of fine sandy loam was plowed on February 2. On February 16 the field was fertilized with 800 lbs./acre of granular 10-10-10, sprayed broadcast with three lbs./acre of Parathion to control wireworms, and planted with seedpieces. After planting, the area was sprayed with Eptam at two lbs./acre and bedded. The plot design in the yield trial was a randomized block replicated four times. Soil moisture at planting was excellent, air temperature was 65° F, no wind, clear sky. Seedpieces were placed on a 12 inch spacing.

The test area was dragged and rebudded on March 15. The growing season was excellent, and plants were not ever considered to be under stress. This test was harvested June 8.

Results and Conclusions. As shown in Table 1, the best potato in the replicated yield trial was the old standard red variety, Bliss. Norchip produced a quite respectable yield, but had internal defects.

As shown in Table 2, yields for the observational trial were very low. Hollow heart was more prevalent than in past years, and internal browning appeared frequently. Line B6044-14 produced a good yield but had too much hollow heart. Actually, no entry in this test was deemed worthy of advancement to yield trials.

South Carolina Table 1. Field data for entries in the Irish potato yield trial (Spring 1971).

Variety	Yield (cwt/A)	Maturity	Shape	Remarks
Alamo	137	M - L	Oval-elongate	Does not cut crisp
Seminole	111	M	Oval-elongate	20% hollow heart
Norchip	171	M - ML	Oval	30% stem end browning
Cobbler	102	M	Oval	20% brown interiors
Bliss	196	M - L	Oval-elongate	20% brown interiors

South Carolina Table 2. Field data for entries in the Irish potato observational trials (Spring 1971).

Entry	Yield (cwt/A)	Shape	Maturity	Size	Remarks
B5421-3	105	Oval	E	Medium	10% hollow heart
B5461-4	81	Oval	L	Large	10% hollow heart
B6044-14	172	Oval-elongate	L	M. large	80% hollow heart
B6097-9	120	Elongate	L	M. large	20% internal browning
B6319-11	96	Elongate	M	Large	20% internal browning
B6495-10	117	Oval	ML	Large	
B6503-5	108	Elongate	ML	M. large	10% hollow heart
B6516-3	108	Oval-elongate	E	Medium	
B6516-5	78	Oval-elongate	M	Small	Flesh not crisp
B6516-15	123	Elongate	M	Small	
B6516-18	105	Oval	L	Large	10% internal browning
B6516-19	90	Oval-elongate	E	Small	40% hollow heart
B6516-20		Not shipped			
B6516-26	75	Oval-elongate	L	Medium	
B6516-28	117	Oval-elongate	E	M. large	10% hollow heart
B6518-10	102	Elongate	L	Small	
B6532-3	78	Elongate	E	Medium	10% internal browning
B6532-4	142	Oval	L	M. large	20% hollow heart
B6532-10	54	Oval	L	Small	
B6532-14	66	Elongate	L	Small	
LaChipper	148	Oval-elongate	M	Medium	
Superior	135	Oval-elongate	E	Small	

TENNESSEE

C. A. Mullins and H. D. Swingle

Forty-nine Irish potato varieties and breeding lines selected for chipping characteristics were evaluated in 1971. These tests were conducted in two plantings at the Plateau Experiment Station near Crossville. The first planting of 40 lines was made on April 16. The second planting of 9 lines was made on April 22. Harvest of both plantings was in mid-September. Soil type was Hartsells fine sandy loam. Plot design was complete block with 3 replications of the 40 variety test and 4 replications of the 9 variety test. Plants were spaced 1 foot apart in 3 foot rows. Fertilization was 2000 # of 6-12-12 broadcast per acre.

The growing season was favorable until late July. Rainfall was very heavy from July 20 through August. A total of 12" of rain fell in August. Specific gravity of the potatoes fell to low levels. Harvest was delayed from mid Aug. to mid Sept. Planned chipping tests were not conducted due to the low potato quality.

Tennessee table 1. Yield, tuber weight, tuber eye depth and tuber appearance of 1 variety and 8 seedling selections.

Variety or Seedling	Yield Per Acre		Average Tuber Wt. (lb.)	Tuber ^{1/} Eye Depth	Tuber ^{1/} Appearance
	Total	No.1			
	Cwt.	Cwt.			
Peconic	160	144	.26	3.0	2.0
BR 6316-4	233	226	.48	1.5	1.0
BR 6316-5	184	178	.44	1.5	1.5
BR 6316-7	266	255	.48	2.2	2.0
B 6545-7	185	169	.38	1.5	1.5
B 6741-23	163	156	.44	2.0	1.8
B 6751-13	131	120	.34	1.8	1.2
B 6879-5	210	200	.30	1.5	1.0
B 6887-6	205	197	.36	3.0	1.2

^{1/} Rating: 1 - 5; 1 = excellent, 5 = poor.

^{1/} Rating: Mean of 4 replications.

Tennessee table 2. Yield, tuber weight, tuber eye depth and tuber appearance of 3 varieties and 37 seedling selections.

Variety or Seedling	Yield Per Acre		Average Tuber Wt. (lb.)	Tuber ^{1/} Eye Depth	Tuber ^{1/} Appearance
	Total	No.1			
	Cwt.	Cwt.			
TL 8134	33	28	.23	1	2
TL 1859	167	154	.42	3	3
B 6708-1	120	80	.20	2	2
B 6967-8	192	184	.36	3	2
B 6774-6	88	71	.21	1	2
B 6967-10	92	79	.29	2	2
B 6815-4	198	187	.47	2	2
B 6967-9	202	186	.40	2	2
B 7005-3	241	219	.42	2	4
B 6967-5	159	148	.30	2	3
B 6995-22	97	93	.33	2	3
B 6967-2	87	80	.34	2	3
B 5281-1	96	88	.17	1	4
B 7005-4	148	144	.42	2	4
B 7021-14	155	149	.27	1	2
B 7005-1	142	134	.53	1	2
B 6516-3	94	86	.23	1	2
B 6595-12	148	106	.22	1	2
B 6503-5	104	99	.28	1	2
B 6564-9	73	71	.25	2	2
B 5647-8	106	96	.26	1	2
B 6603-6	227	221	.36	2	3
B 5516-20	121	118	.26	2	2
B 5698-8	146	137	.30	2	2
B 6562-14	150	142	.30	1	2
B 6532-14	83	50	.16	1	1
B 6495-10	283	272	.37	2	2
B 6815-14	224	218	.55	2	2
B 6731-2	85	79	.23	2	2
B 6751-3	203	190	.26	1	2
Red Lasoda	227	215	.31	3	2
Kennebec	223	218	.33	1	1
B 6968-3	125	107	.22	2	3
B 6603-12	220	202	.23	1	2
B 6532-4	179	175	.39	2	1
B 5665-7	142	127	.35	2	2
B 6516-10	197	191	.30	1	1
La Rouge	214	205	.39	3	2
B 6567-27	167	154	.24	2	2
B 6515-26	212	210	.28	1	3

^{1/} Rating: 1-5; 1= excellent, 5= poor.

TEXAS

R. D. Peel 1/, S. B. Norrell 1/, R. L. Nickeson 2/, C. E. Cunningham 2/

Cooperative Testing of Potato Varieties for Use in Soups. Potato variety trials were grown in replicated tests in five (5) locations in Texas in 1971: Mission (south Texas); Pearsall (south central Texas); Hondo (south central Texas); Munday (north central Texas) and Hereford (northwest Texas).

Mission (Hidalgo County). None of the numbered varieties outyielded the standard variety Kennebec but five (5) of the new varieties were not significantly different in yield than the standard and had an overall higher rating. Two of the numbered varieties had a higher specific gravity than the standard Kennebec and only one was lower (Table 1).

Pearsall (Frio County). None of the varieties at this location were higher yielding than Kennebec, although only two (2) of the numbered varieties were lower yielding. Many of the new varieties had a higher tuber rating than the standard. Twelve (12) of the numbered varieties had a lower specific gravity than Kennebec; six were the same and none was higher (Table 2).

Hondo (Medina County). Some good yields were present at this location but none were higher than the standard. Thirteen (13) of the numbered varieties were lower yielding and five (5) were the same. There were seven (7) varieties higher in specific gravity and ten (10) lower than Kennebec (Table 3).

Munday (Knox County). High temperatures coupled with unseasonable rainfall ruined these plots just prior to harvest and they were abandoned.

Hereford (Deaf Smith County). Excellent yields were recorded at this Northwest Texas location. Fifteen (15) of the numbered varieties were higher yielding than the standard Kennebec but none ~~was~~ higher than Alamo. All of the numbered varieties received a higher tuber rating than Kennebec and six (6) were higher than Alamo. Fourteen (14) were higher in specific gravity and none ~~was~~ lower (Table 4).

1/ Campbell Institute for Agricultural Research, Paris, Texas

2/ Campbell Institute for Agricultural Research, Riverton, New Jersey

Texas Table 1 - Total, % No. 1, specific gravity and overall rating of varieties grown at Mission, Texas, 1971

Variety	Total Yield 100# Bags/A	% No. 1	Specific Gravity	Overall Rating*
Norchip	199	87	1.075	3.0
Kennebec	195	87	1.070	2.0
**BR 6316-7	179	84	1.074	3.0
BR 5970-4	174	86	1.059	3.0
BR 6626-5	168	89	1.069	3.0
BR 6463-2	166	79	1.075	3.0
BR 5960-5	165	85	1.067	3.0
BR 6491-5	156	81	1.081	2.5
BR 6820-26	154	86	1.070	3.0
Alamo	151	85	1.066	3.5
BR 6317-21	147	86	1.066	3.0
BR 6448-7	147	85	1.066	3.0
BR 6306-22	143	89	1.070	3.0
BR 6820-29	143	87	1.068	2.5
BR 6851-2	143	90	1.070	3.5
BR 6446-2	141	89	1.071	3.0
BR 6824-1	141	74	1.073	2.5
BR 6456-1	135	83	1.070	3.5
BR 6316-5	129	90	1.076	3.5
Katahdin	117	88	1.064	3.5
BR 6862-2	102	93	1.067	3.5
BR 6617-2	97	88	1.060	3.5
L.S.D. .05	36	7	0.005	
c.v.	17.2	5.4	0.331	

* 1 = Poor to 5 = Excellent

** BR selections are the result of cooperative investigations between U.S.D.A. and Campbell Soup Company

Planting date - January 14

Harvest date - May 7

Row spacing - 36 inches

Plant spacing - 12 inches

Plot size - 2 rows, 12 feet long

Plot design - Randomized block

Replications - 4

Fertilizer - 100# N, 60# P, 15# K before planting

Sidedress 64# N32

Texas Table 2 - Total, % No. 1, specific gravity and overall rating of varieties grown at Pearsall, Texas, 1971

Variety	Total Yield 100# Bags/A	% No. 1	Specific Gravity	Overall Rating*
**BR 5970-4	218	89	1.064	3.5
BR 5960-5	210	96	1.073	3.0
BR 6317-21	193	91	1.058	3.0
Norchip	190	90	1.075	3.0
Katahdin	189	90	1.068	3.0
BR 6448-7	186	95	1.060	2.5
BR 6446-2	183	95	1.066	3.0
Kennebec	180	91	1.074	2.5
Seminole	176	96	1.079	2.5
BR 6306-22	175	91	1.063	2.5
BR 6820-26	172	88	1.059	3.0
BR 6626-5	170	86	1.067	3.0
Alamo	164	84	1.061	3.0
BR 6316-7	160	82	1.076	2.5
BR 6316-5	156	92	1.074	3.5
BR 6456-1	152	90	1.062	3.0
BR 6851-2	152	93	1.066	3.0
BR 6862-2	152	91	1.069	3.0
BR 6463-2	148	90	1.072	2.5
BR 6824-1	142	94	1.074	2.5
BR 6820-29	135	86	1.061	3.0
BR 6617-2	126	92	1.055	3.0
BR 6491-5	121	77	1.077	3.0
Oromonte	74	77	1.059	2.0
L.S.D. .05	49	8	0.004	
c.v.	32.8	6.5	0.297	

* 1 = Poor to 5 = Excellent

** BR selections are the result of cooperative investigations between U.S.D.A. and Campbell Soup Company

Planting date - February 4

Harvest date - June 10

Row spacing - 36 inches

Plant spacing - 12 inches

Plot size - 2 rows, 12 feet long

Plot design - Randomized block

Replications - 4

Fertilizer - 800# 16-20-6

Texas Table 3 - Total, % No. 1, specific gravity and overall rating of varieties grown at Hondo, Texas, 1971

Variety	Total Yield 100# Bags/A	% No. 1	Specific Gravity	Overall Rating*
**BR 5960-5	262	97	1.084	3.5
BR 6316-7	253	94	1.083	3.0
Kennebec	242	95	1.078	3.0
BR 6463-2	232	94	1.082	3.5
Norchip	229	95	1.081	3.0
BR 6820-26	220	93	1.074	3.0
BR 6446-2	219	99	1.071	4.0
BR 6491-5	212	94	1.093	3.0
BR 6626-5	208	93	1.081	4.0
BR 6306-22	205	99	1.075	3.0
Alamo	202	98	1.070	4.0
BR 5970-4	202	88	1.071	3.0
BR 6824-1	176	93	1.086	2.5
Katahdin	173	98	1.073	3.5
BR 6456-1	156	93	1.069	3.0
BR 6316-5	154	95	1.090	4.0
BR 6448-7	149	98	1.073	3.5
Seminole	147	98	1.095	3.0
BR 6617-2	143	98	1.065	4.0
BR 6820-29	141	91	1.071	3.0
BR 6851-2	139	97	1.076	3.5
Oromonte	129	87	1.081	2.5
BR 6317-21	124	89	1.067	3.5
BR 6862-2	99	92	1.065	3.0
L.S.D. .05	30	5	0.003	
c.v.	11.5	3.5	0.186	

* 1 = Poor to 5 = Excellent

** BR selections are the result of cooperative investigations between U.S.D.A. and Campbell Soup Company

Planting date - February 15

Harvest date - June 16

Row spacing - 36 inches

Plant spacing - 12 inches

Plot size - 2 rows, 12 feet long

Plot design - Randomized block

Replication - 4

Fertilizer - 400# 12-24-12 before planting

300# 11-37-0 at planting under seed piece

Texas Table 4 - Total, % No. 1, specific gravity and overall rating of varieties grown at Hareford, Texas, 1971

Variety	Total Yield 100# Bags/A	% No. 1	Specific Gravity	Overall Rating*
Alamo	406	96	1.065	3.0
**BR 6456-1	394	97	1.066	3.0
Red LaSota	388	96	1.065	3.0
BR 5960-5	387	95	1.078	4.0
BR 6820-26	385	93	1.074	3.0
BR 6316-5	360	97	1.081	3.0
Norchip	353	92	1.077	3.0
BR 6306-22	353	97	1.067	3.0
BR 6448-7	347	95	1.068	3.0
BR 5970-4	339	92	1.072	4.0
BR 6446-2	337	96	1.072	4.0
BR 6626-5	332	92	1.077	3.0
Bounty	330	93	1.074	3.0
BR 6463-2	325	90	1.078	3.0
BR 6617-2	321	95	1.062	4.0
New Haig	316	93	1.072	3.0
Norgold Russet	307	92	1.071	4.0
Seminole	302	97	1.087	3.0
BR 6862-2	298	95	1.078	3.0
BR 6317-21	291	92	1.073	4.0
Sioux	282	96	1.086	3.0
BR 6824-1	278	97	1.080	3.0
Chieftan	272	93	1.068	3.0
Dazoc	270	94	1.075	3.0
BR 6820-29	268	93	1.077	3.0
Katahdin	264	87	1.064	3.0
BR 6491-5	248	89	1.085	3.0
BR 6851-2	239	97	1.074	4.0
BR 6316-7	219	91	1.073	3.0
Shurchip	214	89	1.073	3.0
Kennebec	195	88	1.065	2.0
Russet Burbank	182	16	1.063	1.0
Oromonte	139	81	1.063	2.0
L.S.D. .05	65	9	0.004	
c.v.	15.4	6.9	0.247	

* 1 = Poor to 5 = Excellent

** BR selections are the result of cooperative investigations between U.S.D.A. and Campbell Soup Company

Planting date - April 1

Harvest date - July 28

Row spacing - 40 inches

Plant spacing - 9 inches

Plot size - 1 row, 24 hills long

Plot design - Randomized block

Replications - 4

Fertilizer - 800# 10-20-10

TEXAS

B. A. Perry, R. E. Webb, M. C. Fuqua, W. N. Lipe and S. D. Cotner

Screening and Evaluation of Potato Varieties
and Breeding Lines

Yield Tests. Trials were planted at three locations, but data were obtained from only two. The varieties were planted in a randomized design with four replications. A replication consisted of 25 seedpieces, planted at 9-inch intervals at Lubbock and 12-inch intervals at Hearne, with 40-inch row spacing. Dacthal at 12-14 pounds per acre was applied preemergence for weed control. Yields and other data are reported in Texas tables 1 and 2.

Observation Lines. New breeding lines were planted at three locations using 10-seedpieces at each location. The evaluations from these lines are reported in Texas table 3.

Alkaloid Test. Four varieties were grown in randomized and replicated test at Hearne as a contribution to the alkaloid study being conducted by ARS. The varieties grown were Kennebec, Katahdin, Russett Burbank and B 5141-6. This material was shipped to Beltsville immediately after harvest.

Summary and Conclusions. Overall yields were only moderately good. Red La Soda and B 5415-6 were the best yielding entries at Lubbock. The best two varieties at Hearne were BR 5960-5 and BR 6315-4. Line BR 5960-5 should be named and released as soon as enough pure stock seed is available for distribution and increase. Line DT 6063-1R should be increased and released or dropped from further testing. Lines B 6044-14 and B 6703-2 from the observational material should be placed in the yield trials another year.

Texas Table 1. Yield Test, Hearne, 1971.

Variety	Yield CWT/Acre ^{1/}	Specific Gravity ^{2/}	Chip Rating ^{3/}	Fry Rating ^{4/}
Norchip	146	76	5	2
Chieftian	110	67	9	4
Kennebec	100	65	8	4
Wauseon	104	-	-	-
B 5415-6	98	71	10	4
Norgold	96	65	10	5
BR 6315-4	155	65	6	3
BR 5960-5	175	75	7	4
BT 5404-2	82	72	7	3
DT 6063-1R	119	74	7	2
La Soda	135	62	9	4
Cobbler	110	75	9	4

^{1/} Yields are based on average from four replications.

^{2/} Determined with potato hydrometer; 1.0 omitted from all ratings.

^{3/} Color ratings made using NPCI reference color chart.

^{4/} Color based on 1-light to 5-very dark; 3 or less acceptable.

Texas Table 2. Yield Test, Lubbock, 1971.

Variety	CWT/Acre ^{1/} US No. 1	% US No. 1	Specific Gravity	Appearance ^{2/}	Recommendation ^{3/}
Red La Soda	357.71a	94.0ab	1.061hj	2	-
B 5415-6	347.78a	95.8a	1.071cd	2	A
New Haig	270.77b	90.4abcd	1.066efg	3	R
Bounty	270.77b	87.6bcd	1.065fgh	3	R
BR 6315-4	263.28bc	91.7abc	1.065fgh	3	R
Wauseon	254.04cd	85.6cd	1.072bcd	4	D
Norgold Russett	248.99d	85.3cd	1.060j	2	-
Surchip	243.41de	86.0cd	1.066efg	3	R
Sioux	243.41de	95.4a	1.079a	3	R
Kennebec	241.50de	86.3cd	1.071cd	3	-
Chieftian	235.05e	89.2abcd	1.063ghj	3	R
Norchip	218.49f	84.1d	1.074bc	3	R
BT 5404-2	208.04g	86.8cd	1.068def	2	R
Dazok	191.49h	87.2cd	1.066efg	4	D
DT 6063-1R	183.82h	94.8a	1.070cde	4	D
Burbank Russett	50.36j	37.0e	1.076ab	5	D

^{1/} Means followed by the same letter are not significant (Duncan's Multiple Range Test, .05 percent level).

^{2/} Rated 1-5; 1 excellent, 5 poor (deep eyes, routh, etc.).

^{3/} D = drop; R = repeat; A = advance to more extensive off station trials.

Texas Table 3. Observation Test, 1971.

Pedigree No.	Skin Color	Specific Gravity ^{1/} Hearne	Specific Gravity ^{1/} Lubbock	Yield CWT/A Lubbock	Recommendation ^{2/}
BR 5960-13	W	78	73	128	R
B 5404-8	Ru	66	58	137	R
B 5458-6	Ru	65	62	231	R
B 6044-14	W	80	84	244	A
BR 6265-8	Ru	85	63	94	R
B 6544-4	Ru	62	63	98	R
B 6548-1	Ru	72	75	199	R
B 6703-2	Ru	78	-	156	A
B 6739-2	W	-	84	275	R
B 6775-4	Ru	73	67	46	R
B 6708-1	R	79	67	120	R
B 6968-3	Ru	-	71	235	R

^{1/} See footnotes at end of Table 1.

^{2/} A = advance to more extensive trials, D = drop, R = repeat. Only lines rated either "A" or "R" included in this table.

VERMONT

W. R. Kelly, R. N. Jensen, S. C. Wiggans, and H. J. Murphy

During 1971, three potato variety trials were conducted in Vermont by the Plant Pest Control Division of the Vermont Department of Agriculture, the Plant and Soil Science Department of the University of Vermont, and the Plant and Soil Science Department of the University of Maine. These trials were located at Westminster, Wolcott, and South Burlington. There were 16 varieties at Westminster and Wolcott and 20 varieties at South Burlington. There were five replicates in a randomized block at each location. Seedpieces of all varieties were planted by hand. They were 9 inches apart for all varieties in all locations. These plantings were part of the tri-state cooperative variety trial of the National Potato Breeding Program.

The plots at Westminster were planted May 20 and harvested September 22. Fertilizer was applied at the rate of 120-180-180 per acre. The potatoes were grown in a light sandy soil. The plots suffered from extreme drought during June and July and yields were low (Vermont Table 1).

The plots at Wolcott were planted May 27, killed September 7, and harvested September 28. Fertilizer was applied at the rate of 144-216-216 per acre. The potatoes were grown in a medium loamy soil. There was adequate moisture and yields were satisfactory (Vermont Table 2).

The plots at South Burlington were planted May 24, killed October 5, and harvested October 14. Fertilizer was broadcast at the rate of 90-90-90 and sidedressed 20-20-20. The potatoes were planted in a light sandy soil. No irrigation was available during the dry weather in June and July, and yields were low (Vermont Table 3).

Line BR-6312-2, highest at Westminster and South Burlington and fourth at Wolcott, has low specific gravity and poor chip color. Line F59103, an early variety, ranked above the middle at all three locations; however, it has little disease resistance. Cascade was high at Wolcott and sixth at Westminster. Green Mountain was second at Burlington.

Vermont Table 1. Yield, percentage of yield between 1-7/8 and 4 inches, specific gravity, and total solids for 16 potato varieties grown at Westminster, Vermont - 1971.

Variety- 1/	Yield above 1½ inches cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/4 to 4 inches	Specific gravity	Percentage total solids	Chip color
Cascade	280bc	93.3	65.6	1.070bc	18.10	6.6cd
Cobblers	179ef	92.3	61.3	1.065fg	17.05	7.2bc
Katahdin	322ab	96.0	82.3	1.064g	16.84	6.6cd
Kennebec	255c	93.5	63.4	1.063gh	16.63	6.3cd
Oromonte	241cd	88.1	53.7	1.069cd	17.89	7.1bc
Peconic	255c	94.9	61.9	1.074ab	18.95	4.6f
Seminole	187cde	96.9	79.7	1.077a	19.58	5.2ef
B5665-7	233cd	93.8	66.3	1.073ab	18.74	5.7de
B6024-3	283bc	93.2	59.7	1.066efg	17.26	6.8cd
BR5957-7	288bc	94.0	71.3	1.070bc	18.10	6.3cd
BR5960-5	243cd	93.7	62.3	1.064g	16.84	5.8de
BR5960-13	335ab	97.2	86.5	1.076a	19.37	5.8de
BR6306-22	142f	85.9	43.7	1.055j	14.94	7.9b
BR6312-2	363a	94.9	73.5	1.060hi	15.99	10.0a
BR6316-5	187cde	95.4	66.3	1.073ab	18.74	4.6f
F59103	255c	96.2	79.7	1.057ij	15.38	6.8cd

1/ Planted - May 20; harvested - September 22, 1971.

Seedpieces of all varieties spaced 9 inches apart.

Fertilizer: 120-180-180.

Vermont Table 2. Yield, percentage of yield between 1-7/8 and 4 inches, specific gravity, and total solids for 16 potato varieties grown at Wolcott, Vermont - 1971.

Variety ^{1/}	Yield above 1½ inches cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1/4 to 4 inches	Specific Gravity	Percentage total solids	Chip color
Cascade	381a	96.8	81.4	1.066ef	17.26	9.6ab
Cobbler	289bcd	94.1	67.1	1.069de	17.89	8.5c
Katahdin	258d	96.4	75.9	1.068de	17.68	8.0cd
Kennebec	345ab	97.0	85.6	1.073cd	18.74	7.4def
Oromonte	275cd	94.0	65.3	1.073cd	18.74	8.4c
Peconic	325abc	96.5	76.0	1.081a	20.43	6.9efg
Seminole	197e	96.9	84.0	1.081a	20.43	6.1g
B5665-7	296bcd	96.7	82.2	1.080ab	20.21	6.2g
B6024-3	312bcd	94.1	63.9	1.061g	16.21	7.9cd
BR5957-7	277cd	94.3	63.7	1.068de	17.68	7.7cde
BR5960-5	256d	95.8	76.9	1.074bcd	18.95	7.7cde
BR5960-13	302bcd	96.4	80.3	1.077abc	19.58	6.5fg
BR6306-22	316bcd	96.8	84.3	1.064ef	16.84	7.4def
BR6312-2	320bcd	93.3	79.5	1.054h	14.73	10.0a
BR6316-5	291bcd	96.5	78.8	1.073cd	18.74	6.8efg
F59103	304bcd	94.2	78.6	1.065ef	17.05	7.3def

^{1/} Planted - May 27; killed - September 7; harvested - September 28, 1971.

Seedpieces of all varieties spaced 9 inches apart.

Fertilizer: 144-216-216.

Vermont Table 3. Yield, percentage of yield between 1-7/8 and 4 inches, specific gravity, and total solids for 20 potato varieties grown at Burlington, Vermont - 1971.

Variety ^{1/}	Yield above 1½ inches cwt./A.	Percentage of yield 1-7/8 to 4 inches	Percentage of yield 2-1¼ to 4 inches	Specific Gravity	Percentage total solids	Chip color
Abnaki	215bc	96.8	79.5	1.073ef	18.74	6.0def
Bake King	227bc	96.5	64.5	1.083a	20.85	8.0ab
Cobbler	180cde	91.2	58.1	1.074ef	18.95	7.3bc
Desiree	204bcd	98.8	91.1	1.074ef	18.95	7.4b
Green Mountain	277ab	96.4	71.0	1.079bc	20.00	8.8a
Katahdin	198cde	96.7	80.0	1.072fg	18.53	6.2cde
Kennebec	201cd	96.8	74.1	1.076c-f	19.37	5.3efg
Norchip	211bc	91.5	51.0	1.076c-f	19.37	4.5ghi
Norland	162cde	93.6	57.3	1.062j	16.42	6.8bcd
Oromonte	202cd	96.8	79.6	1.075def	19.16	5.3efg
Peconic	160cde	86.0	32.3	1.076cde	19.37	3.5i
Reliance	173cde	92.4	68.0	1.067hi	17.47	7.9ab
Russet Burbank	135de	74.9% 4-10 oz. size		1.079cd	20.00	5.7defg
Superior	124e	94.2	61.4	1.076c-f	19.37	4.9efgh
Wauseon	213bc	98.0	84.3	1.069h	17.89	4.7fgh
B6024-3	187cde	95.2	63.9	1.062j	16.42	6.1cde
BR5960-5	157cde	88.5	48.1	1.074ef	18.95	5.6defg
BR5960-13	217bc	97.3	81.9	1.082ab	20.64	3.8hi
BR6312-2	314a	97.5	82.1	1.065ij	17.05	8.8a
F59103	214bc	97.8	80.7	1.065ij	17.05	5.4efg

^{1/} Planted - May 24; killed - October 5; harvested - October 14, 1971.

Seedpieces of all varieties spaced 9 inches apart.

Fertilizer: 90-90-90 broadcasted; 20-20-20 sidedressed.

VIRGINIA

Boyett Graves
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Potato Variety and Seedling Evaluations

Culture. Seed stocks were hand cut, treated and hand planted on March 16. Fertilizer at the rate of 1,000 pounds of 10-10-10 per acre and systemic insecticide (phorate) at three pounds actual/acre were band placed at planting. Sprinkler irrigation was used two times during late June. Plots were replicated (except long types) four times. Plots were harvested on July 20, specific gravity was determined on July 21 and samples for chipping were taken and chipped on July 21.

Results Summary. The most noteworthy single factor in the 1971 trials was the appearance of "speckle leaf" damage diagnosed as oxidant or, more particularly, ozone injury. Speckling of the underside of leaves has been noted for many years on the Eastern Shore of Virginia but never in damaging amounts. The locally important varieties LaChipper, Alamo, and Superior suffered considerable damage in growers' fields and in research plots in June. The selections HiPlains, Reliance, B5647-8, B6558-16, B6587-11, B6516-26, B6503-5, B6516-5, B6516-3, B5421-3, and B6685-3 were almost completely killed in the variety plots. The selections 6 HS-9, B6595-5, B6603-6, B6044-14, B6495-20, B6139-11, B6518-10, and B6516-20 appeared to have good resistance.

The ratings shown for speckle leaf injury in Tables 1 and 2 should be viewed with some reservations since some varieties (examples Pango and Norchip) which showed fairly good resistance over several thousand acres were occasionally heavily damaged. The amount of speckle leaf injury appears to be highly influenced by the particular physiological state that plants are in at the time high levels of oxidants occur.

Conditions conducive to mild preharvest sprouting were present during the 1971 growing season. The "yes" notations for preharvest sprouting in Tables 1 and 2 reflect a small amount of sprouting. Reliance was the only selection in the 1971 trial that sprouted badly.

The selections B6503-5 and B6516-5 showed exceptional promise as good chippers after a 30-day storage period. Selections B6503-5, B6516-5, 70T-2, 6HS-9, B6139-11, HiPlains, and B6595-5 all produced chips of good color after 12 days of storage.

Yields and ratings of several characters are shown in Tables 1, 2, 3, and 4.

Virginia Table 1. Yields and comparative ratings of several characters of potato selections grown on the Eastern Shore of Virginia, 1971.
Selections tested two or more years.

	Yield cwt/acre ^{1/}	Specific Gravity at Harvest	Appearance Rating ^{2/}	Plant Vigor ^{3/}	Speckle, Leaf Rating ^{4/}	Preharvest Sprouting	Chip Color 1 Day after Harvest ^{5/}	Chip Color 10 Days after Harvest ^{5/}
6HS-9	271 a	1.076	2.5	2.5	2.0	Few	1	3
B6595-5	265 a	1.078	2.0	3.0	1.5	Yes	1	4
Pungo	254 a	1.074	2.0	2.5	1.5	Yes	2	6
Wauseon	252 a	1.067	1.5	2.0	2.5	Few	1	2
B5267-2	230 ab	1.072	4.0	2.5	3.0	Yes		
7GW-9	225 ab	1.088	1.5	2.5	2.0	Yes	3	5
Nor. Russet	222 ab	1.073	2.5	2.0	3.0	Yes		
Superior	215 ab	1.071	2.5	2.0	2.5	Yes	2	5
Norchip	213 ab	1.077	2.5	2.5	1.5	No	1	2
Alamo	213 ab	1.065	1.5	2.5	3.0	Few	2	7
B6603-6	212 ab	1.084	2.0	2.0	1.5	Yes	1	6
Reliance	211 ab	1.061	3.5	2.5	5.0	Yes		
B6044-14	210 ab	1.084	2.0	3.0	1.5	Yes		
Chippewa	208 ab	1.067	2.5	2.0	3.0	No	1	6
LaChipper	206 ab	1.070	2.0	3.0	3.5	No	1	5
Katahdin	206 ab	1.065	1.5	3.0	3.0	Yes	1	6
Shurchip	203 ab	1.071	2.5	2.0	3.5	Yes	1	4
B6516-27	169 bc	1.064	1.5	2.0	3.0	No	1	4
HiPlains	136 c	1.062	1.5	2.0	5.0	No	1	5
B5647-8	84 d	1.057	1.0	2.5	4.5	Yes		

^{1/} Yields followed by a letter in common are not significantly different at 1% level of probability.

^{2/} 1.0 = very attractive; 5.0 = rough, uniform, low eye appeal.

^{3/} 1.0 = plants vigorous, thrifty, fast growing; 5.0 = plants unthrifty, spindly, slow growing.

^{4/} 1.0 = very little speckling on few leaves; 5.0 = most leaves heavily speckled and yellowed; plants approaching death.

^{5/} Chip color 1.0 thru 3.0 light color and desirable; 4.0-5.0 marketable but not highly desirable; 6.0-10.0 dark brown and unmarketable.

Virginia Table 2. Yields and comparative ratings for several characters of potato selections grown for the first time on the Eastern Shore of Virginia, 1971.

	Yield cwt/acre	Specific Gravity at Harvest	Appearance Rating ^{1/}	Plant Vigor ^{2/}	Speckle Leaf Rating ^{3/}	Preharvest Sprouting	Chip Color 1 Day after Harvest ^{4/}	Chip Color 10 Days after Harvest ^{4/}
B6495-20	287	1.096	2.5	2.5	1.5	No	2	6
Pungo (Ck.)	282	1.074	2.0	2.0	2.0	Yes	2	6
B6139-11	270	1.093	3.0	3.0	1.5	No	2	4
FL162	264	1.073	2.5	2.0	2.0	No	1	5
B6518-10	259	1.091	2.5	2.0	1.0	Yes		
Alamo (Ck.)	251	1.065	1.5	2.5	3.0	No	2	7
70T-2	240	1.068	1.5	2.5	2.5	No	1	2
70A-12	236	1.065	3.0	3.0	3.0	Yes	2	4
Abnaki	230	1.071	2.0	2.5	2.5	No	2	5
B6516-28	229	1.080	3.0	2.0	2.5	No		
B6097-9	228	1.082	2.5	2.0	2.5	Yes	1	7
70E-1	222	1.081	1.5	1.5	2.0	No	2	5
B6698-19	220	1.082	3.0	2.5	2.5	Yes		
B6516-15	218	1.082	2.5	2.0	3.0	Yes	1	4
B6532-3	216	1.085	3.0	2.5	2.0	Yes	2	6
B5461-4	215	1.073	2.0	3.0	2.5	No	1	5
Superior (Ck.)	211	1.071	1.5	2.0	3.5	Yes		
B6532-4	200	1.080	1.5	2.0	3.5	Yes		
B6516-20	193	1.086	2.5	3.0	1.0	Yes		
7GS-6	193	1.067	2.5	3.5	2.0	No		
B6558-16	183	1.068	2.5	3.5	4.0	Yes	1	5
B6587-11	182	1.069	2.0	3.0	4.0	Yes	2	5
B6516-26	182	1.083	2.0	3.0	4.0	No		
B6503-5	171	1.087	1.0	2.0	4.0	No	1	1
B6516-19	159	1.078	3.0	3.5	2.5	Yes		
B6516-5	152	1.082	1.5	3.0	4.0	No	1	2
B6516-18	130	1.084	2.0	3.5	3.0	Yes		
B6516-3	130	1.080	1.0	3.0	4.0	Yes		
B6532-10	118	1.084	2.0	4.0	3.0	Yes		
B6532-14	100	1.080	3.0	2.5	3.0	Yes		
B5421-3	71	1.065	1.5	2.5	5.0	No		
B6585-3	48	1.051	1.0	4.0	5.0	Yes		

^{1/} 1.0 = very attractive; 5.0 = rough, uniform, low eye appeal.

^{2/} 1.0 = plants vigorous, thrifty, fast growing; 5.0 = plants unthrifty, spindly, slow growing.

Virginia Table 2 (continued)

3/ 1.0 = very little speckling on few leaves; 5.0 = most leaves heavily speckled and yellowed; plants approaching death.

4/ Chip color 1.0 thru 3.0 light color and desirable; 4.0-5.0 marketable but not highly desirable; 6.0-10.0 dark brown and unmarketable.

Virginia Table 3. Yields of potato selections grown at Painter, Virginia, 1971.

Selection	Cwt/A (Duncan's Mult. Range 1%)
B6495-20	287 a
Pungo	282 ab
B6139-11	270 abc
FL162	264 abcd
B6518-20	259 abcd
Alamo	251 abcde
70T-2	240 abcdef
70A-12	236 abcdef
Abnaki	230 bcdef
B6516-28	229 bcdefg
B6097-9	228 bcdefg
70E-1	222 cdefg
B6698-19	220 cdefg
B6516-15	218 cdefg
B6532-3	216 cdefg
B5461-4	215 cdefgh
Superior	211 defgh
B6532-4	200 efghi
B6516-20	193 fghi
7GS-6	193 fghij
B6558-16	183 fghij
B6537-11	182 fghij
B6516-26	182 fghijk
B6503-5	171 ghijk
B6516-19	159 hijkl
B6516-5	152 ijkl
B6516-18	130 jklm
B6516-3	130 jklm
B6532-10	118 klm
B6532-14	100 lmn
B5421-3	71 mn
B6585-3	48 n

Virginia Table 4. Yield and performance of long-type potato selections grown in non-replicated plots. Virginia Truck and Ornamentals Research Station, 1971.

Selection	Yield cwt/acre	Plant ₁ / Vigor	Specific Gravity at Harvest	Shape
BR6306-22	253	2.0	1.063	About 50% long type; remainder oblong.
B5267-2	207	2.0	1.073	About 50% long type; remainder round to oblong.
B6139-11	340	2.0	1.069	Mostly round oval shape, very few long type.
B6503-5	199	2.5	1.097	Mostly blocky and long; some oblong.
B6534-2	287	1.5	1.067	About 60% long tubers, some oblong, some round.
B6535-10	157	3.0	1.057	About 50% long; remainder oblong.
B6548-3	133	2.5	1.074	All pear shaped.
B6565-2	249	2.0	1.064	Mostly round or short oval.
B6597-20	162	2.5	1.067	Mostly oblong, few round.
B6897-5	316	3.0	1.057	Mostly oblong, some round tubers.
Nor. Russet (Ck.)	263	1.5	1.078	Mostly long, few oblong.
Alamo (Ck.)	257	2.0	1.065	All round.

1/ Plant vigor: 1.0 = plants vigorous, thrifty, fast growing; 5.0 = plants unthrifty, spindly, slow growing.

WASHINGTON

Wm. G. Hoyman

The objective of the cooperative potato breeding project is to obtain one or more new varieties--preferably with russet skin--resistant to the common pathogens present in the Pacific Northwest and having desirable qualities for processing. Approximately 50,000 potted seedlings are grown in 2 screen-houses each year at the Irrigated Agricultural Research and Extension Center, Prosser, Washington. An isolated seed-increase plot is maintained on a ranch at the base of Mt. Adams.

August and October harvest trials. N, P and K were broadcast before plowing at the rate of 300, 50 and 240 pounds per acre, respectively. A starter fertilizer containing 59, 11 and 25 pounds per acre of N, P and K, respectively, was banded at planting. Three pounds per acre of Eptam herbicide were applied previous to planting. The seed for each trial was cut April 16, dusted with 5% Captan and planted the following day in a randomized block design having 10 seed pieces of each cultivar in each of 4 replicates. Seed-piece size was 1.5 to 2 ounces and it was spaced 12 inches within and 38 inches between rows. Three pounds per acre of the active ingredient in disulfoton were banded at planting and Endosulfan spray was applied June 25 and at 2-week intervals thereafter. A prolonged heat wave in August was undoubtedly a factor causing heat sprout of certain selections (Tables 1 and 5). Harvest dates were August 16 and October 4.

Data for both trials are given in Washington tables 1 and 2. Abnaki had the highest yield (752 cwt.) at the August harvest but its chip color (9) was too dark. Cascade M, a mutation from Cascade, was the highest yielder (883 cwt.) at the October harvest followed by BR6316-7 (852 cwt.). Cascade M yielded 165 cwt. per acre more than Cascade and was much more resistant to Verticillium albo-atrum.

Washington table 2 gives the chip color from 40°F storage and after storage at 70°F for 14 and 28 days. Only 9 selections scored 7 or less after 28 days.

Washington table 3 shows the reaction of 104 cultivars to Diporotheca rhizophila, Verticillium albo-atrum and Meloidogyne hapla. This test was conducted in a field that has been planted to potato annually since 1958. Each cultivar was replicated twice and the upper 12 inches of each root system was examined for symptoms of blackroot and rootknot. Only 8 selections remained free of blackroot symptoms while 46 were devoid of rootknot. Only the roots of 5 selections, including the russet 168-3, were free of the symptoms of both pathogens. The tubers of 11 selections had no external nor internal M. hapla symptoms and 8 of these had no root symptoms. Russet selection 168-3 was the only cultivar that did not have symptoms of all 3 pathogens.

Washington table 4 shows the incidence of D. rhizophila and M. hapla on 149 introductions of 51 Solanum species. The experiment was located in the field that had grown potatoes annually since 1958. Each introduction was replicated twice and the upper 12 inches of each root system was examined

for symptoms of blackroot and rootknot. Only a few of the tuber-bearing introductions produced tubers under the environs of eastern Washington. Fifty-five percent of the introductions had blackroot symptoms and in most instances the symptoms were scored as very slight (1) or slight (2). Root-knot resistance was more prevalent among the Solanum species than among S. tuberosum selections (Table 3). Seventy-five percent of the introductions were free of root-knot while only 44% of the selections in table 3 did not show symptoms.

Forty-two selections from Campbell Soup Company and the United States Department of Agriculture were included in the observational trial (Table 5). These cultivars received the same cultural treatment as those in the variety trials and yields have been omitted because of insufficient seed for replication. Some of these will be entered in the 1972 variety trials.

Washington table 1. August harvest trial, Prosser, Washington.

Selection or variety	Yield per acre Gwt.	Tubers				Verticillium ³ wilt vine symptoms	Specific gravity	Chip color ⁴
		1 Number	2 Scab Pct.	Hollow heart Pct.	Heat sprout Pct.			
284-1	529	260	24	0	6.0	1.25	1.069	9
284-5	361	231	17	0	0	2.75	1.063	9
BR5960-5	588	339	27	0	0	.50	1.079	6
BR5960-13	543	372	36	0	1.0	0	1.076	7
B6044-14	447	268	29	2.0	2.0	2.25	1.085	8
BR6316-5	605	274	39	0	0	2.00	1.082	7
BR6316-7	536	416	9	1.0	15.0	0	1.073	9
BR6456-1	481	393	27	0	0	3.25	1.077	8
BR6463-2	581	403	18	0	5.0	.50	1.084	8
BR6491-5	450	432	28	0	0	2.00	1.089	4
B6503-2	632	232	18	0	1.0	.25	1.074	7
BR6614-1	564	191	42	0	1.0	1.00	1.066	8
BR6626-5	588	444	16	0	0	2.00	1.083	7
B6936-16	491	389	4	1	0	2.25	1.091	6
B6952-10	481	223	11	0	0	1.75	1.084	4
B6955-24	495	241	18	0	0	1.50	1.078	4
B6955-35	491	377	17	0	0	1.00	1.085	7
B6986-2	457	233	33	1.0	1.0	3.50	1.076	5
B6987-18	488	236	5	0	2.0	2.75	1.076	5
B6987-43	433	216	35	2.0	3.0	1.50	1.082	5
B6987-54	581	316	7	0	1.0	1.00	1.078	4
B6987-57	495	231	28	0	1.0	1.75	1.084	4
Abnaki	752	297	33	0	0	1.25	1.069	9
Cascade	711	439	26	0	0	1.25	1.080	7
Cascade M	577	480	2	0	2.0	0	1.072	9
Kennebec	656	293	3	0	0	1.00	1.070	5
Norchip	508	406	2	0	0	1.75	1.080	5
Norgold Russet	385	341	4	1.0	0	4.00	1.073	9
Russet Burbank	481	362	0	0	3.0	1.25	1.071	8

Washington table 1, continued.

- ¹Calculated from actual number of hills. Forty seed pieces planted.
- ²Includes tubers with slight to severe infection.
- ³0 = no vine symptoms. 5 = vine dead. Reading taken August 3, 1971.
- ⁴Chipped the eighth day following harvest.

Washington table 2. October variety trial, Prosser, Washington.

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Selection or variety	Yield /acre	U.S. No. 1	Hollow heart	Verti- ¹ cillium wilt	Specific gravity	Chip color ²			Tuber ³ characteristics
						From 40° F	At 70° F		
							14 days	28 days	
Cwt.	Pct.	Pct.	Pct.						
168-3	550	97	1.2	2.75	1.081	10	9	9	R, oblong
284-1	533	91	0	3.00	1.070	10	10	10	R, oblong
284-5	526	94	9.2	3.75	1.065	10	10	10	R, oblong
285-3	543	89	0	3.75	1.063	10	9	9	R, oblong
320-1	786	96	.8	2.75	1.070	10	10	9	R, oblong
BR5960-5	694	96	0	1.50	1.076	10	9	8	W, round
BR5960-13	673	96	0	0	1.077	10	9	8	W, round
B6044-14	529	95	.6	4.00	1.078	10	10	8	R, round-oblong
BR6316-5	653	95	2.1	3.25	1.076	10	10	8	W, round-oblong
BR6316-7	852	88	0	0	1.084	10	10	8	W, oblong
BR6456-1	519	97	4.6	4.50	1.066	10	10	9	W, round
BR6463-2	704	89	0	2.50	1.076	10	9	8	W, oblong
BR6491-5	533	90	0	3.50	1.079	10	9	8	W, oblong
B6503-2	794	93	1.3	1.50	1.075	9	8	7	W, oblong
BR6614-1	605	89	0	2.25	1.066	10	10	8	W, oblong
BR6626-5	629	90	0	3.25	1.073	10	10	9	W, oblong
B6936-16	515	91	.7	4.50	1.085	9	9	7	W, round
B6952-10	502	92	0	3.50	1.082	10	9	6	W, round
B6955-24	505	97	0	4.00	1.081	9	9	6	W, round-flat
B6955-35	515	87	0	2.50	1.090	10	8	5	W, round
B6986-2	502	86	6.8	4.50	1.086	10	9	9	W, round
B6987-18	498	95	1.3	4.75	1.080	10	10	7	W, oblong-flat
B6987-43	481	92	0	3.25	1.092	10	9	6	W, round
B6987-54	539	96	0	3.00	1.084	10	9	7	W, round-flat
B6987-57	584	98	1.7	4.00	1.087	10	9	7	W, oblong-flat
Abnaki	684	93	0	3.25	1.076	10	10	9	W, round-flat
Cascade	718	90	0	2.75	1.079	10	10	9	W, oblong
Cascade M	883	94	0	.50	1.082	10	10	9	W, oblong
Kennebec	732	93	0	2.75	1.075	10	9	8	W, oblong
Norchip	591	94	0	3.00	1.088	10	9	8	W, round, DSE
Norgold	495	91	0	5.00	1.084	10	10	9	R, oblong
Russet Burbank	498	87	0	3.00	1.074	10	10	9	R, long

Washington table 2, continued.

¹0 = no vine symptoms. 5 = vine dead. Reading taken August 18, 1971.

²Harvested October 4, 1971 and stored at 40° F until chipped November 29. Chipped after 14 and 28 days at 70° F.

³R = russet skin, W = white skin, Ob = oblong, Ro = round, DSE = deep seed end.

Washington table 3. Reaction of cultivars to Diporotheca rhizophila (blackroot), Verticillium albo-atrum (wilt) and Meloidogyne hapla (root-knot).

Cultivar	Root disease index		Vine wilt index		Tubers		Percent galled tubers with internal lesions				
	Black-root	Root-knot	7/22	8/27	Num-ber	Percent galled	None	1-5	6-10	11-20	>20
168-3	0.0	0.0	0.0	3.5	37	0.0	0.0				
284-1	0.5	0.0	1.0	4.0	39	5.1	73.0	21.6	5.4		
284-5	1.5	1.0	0.0	4.5	17	0.0	70.6	23.5	5.9		
285-3			1.0	5.0	23	16.7	47.4	47.4	5.2		
320-1			0.0	3.5	46	17.4	84.2	15.8			
328-1	0.0	0.5	0.0	2.5	54	0.0	87.0	13.0			
328-2	1.0	0.0	1.0	5.0	50	0.0	70.0	30.0			
328-3	1.0	0.0	0.5	4.0	53	0.0	92.4	7.6			
328-4	0.0	0.0	2.0	5.0	50	0.0	82.0	14.0	4.0		
328-5	0.0	0.0	2.0	5.0	61	0.0	93.4	6.6			
328-6	1.0	0.0	0.0	4.5	56	1.8	54.6	23.6	21.8		
Cascade	0.5	0.5	0.0	3.5	52	7.7	52.1	18.2	4.2	16.7	8.3
Kennebec	0.5	1.0	0.5	5.0	42	30.9	51.8	48.2			
Norgold Russet	2.0	0.0	3.0	5.0	53	18.9	90.7	9.3			
Russet Burbank	0.5	0.5	1.0	4.0	55	0.0	12.7	83.7	3.6		
Norchip	2.5	0.0	2.0	4.0	55	47.3	96.5	3.5			
Abnaki	0.0	0.0	1.5	5.0	50	0.0	76.0	16.0	6.0	2.0	
A477-8	1.0	1.0	0.0	1.5	48	37.5	26.7	46.7	16.7	6.6	3.3
A483-6	1.5	0.5	1.0	3.0	53	13.2	8.7	52.2	39.1		
A503-42	1.5	0.5	0.0	1.5	54	14.8	6.5	43.5	30.4	13.1	6.5
A6305-20	1.0	0.0	2.5	4.5	48	6.3	51.1	8.9	40.0		
A6334-19	0.0	1.0	0.0	2.0	55	0.0	65.4	31.0	1.8	1.8	
A6334-20	0.5	0.0	0.0	2.0	75	1.3	82.4	5.4			12.2
A6353-6	0.5	0.0	0.0	0.0	58	0.0	58.6	22.4	3.5	5.2	10.3
A6371-2	1.0	1.5	0.5	2.5	55	3.8	29.0	71.0			
A6371-3	1.0	1.5	0.0	1.0	45	24.4	50.0	32.4	17.6		
A6382-10	2.0	1.0	1.5	4.5	56	3.6	63.0	35.2	1.8		
A6477-4	1.5	2.0	0.0	0.0	56	23.2	25.6	74.4			

Washington table 3, continued.

Cultivar	Root disease index ¹		Vine wilt index ¹		Tubers		Percent galled tubers with internal lesions				
	Black- root	Root- knot	7/22	8/27	Num- ber	Percent galled	None	1-5	6-10	11-20	>20
A6536-5	0.5	0.5	0.5	3.0	54	48.1	50	21.4	14.3		14.2
A6673-15	0.5	0.5	0.0	3.5	52	9.6	29.8	61.8	4.2	4.2	
A6698-2	1.1	0.5	0.5	2.5	37	2.7	97.2	2.8			
NDA7938-3	0.5	1.5	0.0	0.5	50	16.0	78.1	12.5	6.3	3.1	
A62180-2	1.5	2.5	0.5	2.0	53	43.4	10.0	46.7	33.4	6.6	3.3
A63123-7	2.0	2.0	0.0	3.5	50	12.0	54.5	31.8	13.7		
A63126-2	1.0	1.0	1.0	3.0	52	34.6	11.8	38.2	20.6	14.7	14.7
A63126-9	0.5	1.0	1.0	1.5	52	25.0	33.3	51.3	12.8	7.6	
A63134-45	2.0	1.0	1.0	3.5	55	12.7	27.1	50.0	18.8	4.1	
A64187-4	1.0	1.0	3.0	3.5	48	29.2	35.3	32.4	14.7	2.9	14.7
A64206-4	1.0	0.5	0.5	3.5	54	11.1	31.3	50.0	12.6	4.1	2.0
A64206-5	0.5	0.0	1.5	4.5	52	17.3	23.3	60.5	11.6		4.6
A66107-44	1.0	1.5	0.0	1.0	53	37.7	60.6	27.3	9.1	3.0	
A66107-69	1.0	1.1	0.0	1.5	49	4.1	36.2	32.0	10.6	10.6	10.6
A66107-75	1.0	1.5	0.0	0.5	54	7.4	20.0	12.0	24.0	14.0	30.0
A66107-98	1.0	0.0	0.0	0.0	54	11.1	47.9	35.4	12.5	4.2	
A66107-101	0.0	1.0	0.0	0.5	61	13.1	34.0	28.3	17.0	5.7	15.0
A66107-117	1.0	1.5	0.0	3.5	55	1.8	18.5	44.4	20.4	13.0	3.7
A66107-180	0.5	0.5	0.0	3.0	54	42.6	67.7	32.3			
A66119-6	1.5	2.0	3.0	4.5	60	10.1	9.3	53.7	14.8	22.2	2.0
A66122-3	1.0	1.5	0.0	1.5	50	2.0	53.1	44.9			
B6044-14	1.0	1.5	0.5	3.0	38	18.4	77.4	19.4	3.2		
B6503-2	1.5	0.0	0.0	1.5	52	0.0	80.7	15.3	4.0		
B6886-2	0.0	0.0	2.5	5.0	43	0.0	88.4	11.6			
B6936-16	0.5	0.0	2.0	5.0	54	0.0	85.2	14.8			
B6952-10	1.5	0.0	0.5	3.5	46	0.0	0.0				
B6955-24	2.5	0.5	1.5	4.0	44	0.0	84.1	15.9			
B6955-35	1.0	0.0	1.5	4.0	53	0.0	36.5	51.9	11.6		
B6987-18	2.5	0.0	2.5	4.5	42	0.0	90.0	10.0			
B6987-43	0.5	0.0	1.5	3.5	52	0.0	88.5	9.6	1.9		
B6987-54	1.0	0.0	1.5	3.5	52	1.9	83.7	17.7			
B6987-57	0.5	0.0	2.0	5.0	53	1.9	67.3	32.7			
B7136-1	1.5	0.0	3.0	5.0	17	0.0	70.6	29.4			

Washington table 3, continued.

Cultivar	Root disease index ¹		Vine wilt index ¹		Tubers		Percent galled tubers with internal lesions				
	Black-root	Root-knot	7/22	8/27	Num-ber	Percent galled	None	1-5	6-10	11-20	>20
B7143-1	0.5	0.0	4.5	5.0	10	0.0	0.0				
B7143-12	2.0	0.5	3.0	5.0	16	0.0	0.0				
B7147-5	0.5	0.5	3.5	5.0	24	0.0	75.0	25.0			
B7147-8	2.0	0.0	2.0	5.0	28	0.0	0.0				
B7147-9	2.5	0.0	2.0	5.0	14	0.0	0.0				
B7147-15	2.5	0.0	2.0	5.0	18	0.0	94.5	5.5			
B7147-17	2.5	0.5	2.5	5.0	19	0.0	0.0				
B7147-20	3.5	0.0	5.0	5.0	12	0.0	91.7	8.3			
B7147-21	2.5	0.0	4.0	5.0	28	0.0	92.8	7.2			
B7147-24	2.5	0.0	3.5	5.0	17	0.0	0.0				
B7147-64	1.5	0.0	4.5	5.0	12	0.0	92.7	8.3			
B7147-76	2.0	0.0	4.0	5.0	19	0.0	0.0				
B7147-83	1.5	0.0	2.5	5.0	9	0.0	88.9	11.1			
B7147-90	1.0	0.0	0.0	5.0	23	4.3	59.0	31.8	9.2		
B7159-25	2.5	0.0	2.0	5.0	14	0.0	0.0				
B7188-55	2.0	1.0	5.0	5.0	26	0.0	92.3	7.7			
B7196-20	2.0	1.0	3.0	5.0	24	0.0	0.0				
B7196-23	1.0	0.0	3.5	5.0	23	0.0	39.1	60.9			
B7196-37	0.5	0.0	4.0	5.0	39	0.0	87.0	13.0			
BR6316-5	2.0	0.0	1.0	4.0	39	0.0	84.6	12.8	2.6		
BR6316-7	2.0	0.0	0.0	0.5	56	0.0	91.0	9.0			
BR6835-1E	1.5	0.5	2.0	5.0	51	5.9	52.1	41.7	6.2		
BR6835-2E	3.5	0.5	3.5	5.0	53	3.8	52.9	39.2	7.9		
BR6835-5E	4.0	0.5	3.0	5.0	35	17.1	62.1	20.7	10.3	6.9	
BR6835-6E	4.0	0.5	1.5	5.0	56	21.4	27.2	47.7	15.9	9.2	
BR6835-7E	0.5	0.5	1.0	4.0	40	17.5	66.7	33.3			
BR6838-6E	1.0	1.0	3.0	3.0	23	0.0	61.0	39.0			
BR6863-1E	2.5	0.0	2.0	5.0	55	40.0	45.5	54.5			
BR6863-2E	1.5	1.0	2.0	2.0	54	25.9	32.5	47.5	15.0	5.0	
BR6863-12E	1.0	0.0	2.0	3.0	49	36.7	93.5	6.5			
BR6863-15E	3.0	0.5	4.0	5.0	44	2.3	55.8	25.6	18.6		
BR7046-1	1.0	1.0	0.0	1.0	51	13.7	75.0	13.7	11.3		
BR7049-2	2.0	0.5	2.0	4.0	48	33.3	46.9	37.5	6.2	9.4	

Washington table 3, continued.

Cultivar	Root disease index ¹		Vine wilt index ¹		Tubers		Percent galled tubers with internal lesions				
	Black-root	Root-knot	7/22	8/27	Num-ber	Percent galled	None	1-5	6-10	11-20	>20
	root										
BR7070-3	1.0	1.0	1.5	5.0	38	0.0	57.9	36.8	5.3		
BR7076-3	1.0	1.5	1.5	5.0	40	60.0	87.5	12.5			
BR7083-1	3.0	0.0	2.0	3.0	52	0.0	55.8	26.9	11.5	3.8	2.0
BR7083-3	1.5	1.0	2.0	3.0	53	67.9	47.0	53.0			
BR7085-1	3.5	0.0	2.0	4.0	44	0.0	45.4	20.4			34.2
BR7093-12	2.0	0.5	3.5	5.0	29	3.4	71.4	25.0	3.6		
BR7093-20	4.5	1.0	5.0	5.0	23	0.0	74.0	26.0			
BR7093-22	1.5	0.0	3.5	5.0	39	52.3	62.5		12.5	25.0	
BR7093-23	1.0	0.5	0.0	3.0	52	48.1	55.5	44.5			
BR7103-7	2.0	0.5	3.5	5.0	36	27.8	88.5	11.5			

¹ 0 = no symptoms, 5 = severe symptoms.

Washington table 4. Incidence of Diporethea rhizophila (blackroot) and Meloidogyne hapla (rootknot) on roots of Solanum species.

Species	Introduction Number	Black- ¹ root	Root- ¹ knot
<i>S. acaule</i>	S-17	1	2
"	S-21	0	1
"	S-39	1	1
"	S-41	1	1
"	S-55	1	0
"	S-79	1	1
"	S-83	3	2
<i>S. ambosinum</i>	S-47	1	0
"	S-61	4	1
<i>S. berthaultii</i>	218215	0	1
"	265857	1	0
"	265858	1	0
"	310925	1	1
<i>S. boliviense</i>	310928	1	0
"	310974	0	0
"	310975	0	0
<i>S. brachistotrichum</i>	283095	4	0
"	320265	1	1
"	1271	1	0
<i>S. brachycarpum</i>	275183	0	0
"	275261	0	0
<i>S. bukasovii</i>	S-77	1	0
<i>S. bulbocastanum</i>	243507	0	0
"	243508	1	0
"	243513	1	0
<i>S. cajamarcense</i>	310988	0	0
<i>S. canasense</i>	265863	0	1
"	265865	1	0
"	265875	0	0
"	265883	0	0
"	S-6	0	1
"	S-24	3	0
<i>S. capsicibaccatum</i>	205560	0	1
<i>S. cardiophyllum</i>	275213	0	0
"	283063	2	0
"	1276	1	0
"	1277	1	0
<i>S. chacoense</i>	230582	1	0
"	275136	2	0
"	275141	1	0
"	368	1	0
"	320	1	1
"	1855	1	0
<i>S. chiquidenum</i>	275269	0	0
"	310989	0	1

Washington table 4, continued.

Species	Introduction Number	Black- ¹ root	Root- ¹ knot
<i>S. commersonii</i>	320269	0	0
<i>S. demissum</i>	218047	0	0
"	230487	0	0
"	230587	0	0
"	230592	1	1
"	338618	0	0
<i>S. fendleri</i>	275163	0	0
<i>S. gourlayi</i>	320341	0	0
<i>S. guerreroense</i>	161727	1	0
<i>S. hjertingii</i>	275174	1	0
"	283103	2	0
<i>S. hougasii</i>	161174	1	0
"	161726	1	0
<i>S. huancabanbense</i>	021x024	3	0
<i>S. infundibuliforme</i>	275146	0	0
<i>S. jamesii</i>	275169	0	0
"	275263	1	0
"	275264	0	0
<i>S. kurtzianum</i>	320271	1	0
"	336	0	0
<i>S. lignicaule</i>	310993	1	0
<i>S. marinasense</i>	310944	0	0
"	1533	0	0
<i>S. megistacrolobum</i>	233124	0	1
"	275148	0	1
"	310977	0	1
"	310978	0	1
<i>S. microdontum</i>	208866	2	0
"	218222	0	0
"	218223	0	0
"	218224	0	0
"	218226	2	0
"	310979	3	1
<i>S. mochicense</i>	S-20	0	0
<i>S. multidissectum</i>	210043	1	0
<i>S. oplocense</i>	265885	0	0
"	320322	0	0
<i>S. pampasense</i>	275274	0	0
<i>S. papita</i>	251740	0	0
"	262895	0	0
"	283143	0	0
<i>S. phureja</i>	320361	1	0
"	320362	1	2
"	320365	1	1
"	320370	1	1
"	320371	1	1
"	320372	1	1
"	320373	1	1
"	320374	2	0

Washington table 4, continued.

Species	Introduction Number	Black- ¹ root	Root- ¹ knot
<i>S. pinnatisectum</i>	275230	2	1
"	275232	1	0
"	275233	4	2
"	275235	3	1
<i>S. polyadenium</i>	161728	1	1
"	175444	1	1
<i>S. polytrichon</i>	255526	2	1
"	283106	1	0
<i>S. raphanifolium</i>	265862	0	0
"	310953	1	0
"	310999	1	1
"	S-58	1	0
<i>S. sanctae-rosae</i>	218221	0	0
"	283089	0	0
<i>S. sogarandinum</i>	230510	0	0
<i>S. sparsipilum</i>	310933	0	0
"	310957	0	0
"	310958	0	0
"	310959	0	0
"	311000	0	0
"	311001	0	0
"	S-95	2	0
<i>S. spegazzinii</i>	275144	1	0
"	310985	0	0
"	320299	1	0
"	320300	0	0
"	320301	1	0
<i>S. stenotomum</i>	234015	5	0
"	283141	3	0
"	1285	2	2
"	1583	1	0
<i>S. stoloniferum</i>	186555	2	0
"	230557	1	0
"	243458	1	0
"	S-19	2	0
"	S-22	1	0
"	S-25	1	0
<i>S. sucrense</i>	230465	0	0
"	283091	0	0
<i>S. tarijense</i>	217457	0	0
"	217458	0	0
"	265577	0	0
"	275154	0	0
<i>S. tuberosum</i>			
ssp. <i>andigena</i>	245926	0	0
"	254931	1	0
"	245935	1	0
"	245937	1	0
"	245940	1	2

Washington table 4, continued.

Species	Introduction Number	Black- ¹ root	Root- ¹ knot
S. vernei	230468	0	0
"	230562	0	0
"	320329	0	0
"	320330	0	0
"	320333	4	0
S. verrucosum	275260	3	0
"	320344	0	0

¹ 0 = no symptoms, 5 = severe symptoms.

Washington table 5. Unreplicated observational trial of advanced selections from Campbell Soup Company and United States Department of Agriculture.

Selection	Percent tubers with:				Specific gravity	Chip ¹ color	Tuber characteristics ²
	Scab	Hollow heart	Growth cracks	Heat sprout			
BR6835-1E	15.5	0.0	2.6	1.3	1.086	4	W, Ob
BR6835-2E	10.0	0.0	4.1	13.4	1.099	6	W, Ro
BR6835-5E	3.7	0.0	0.0	9.2	1.074	7	W, L
BR6835-6E	2.4	0.0	4.8	30.1	1.067	7	W, Ob
BR6835-7E	0.8	0.8	8.9	4.9	1.087	7	W, L, K
BR6838-6E	7.7	0.0	6.1	21.5	1.080	7	W, L
BR6863-1E	6.3	0.0	6.3	0.0	1.097	4	W, Ro, DE
BR6863-2E	0.6	0.0	3.1	1.9	1.084	7	W, Ob
BR6863-12E	14.5	0.0	3.8	0.0	1.077	7	W, Ro
BR6863-15E	1.4	0.0	2.1	0.0	1.087	3	W, Ro
BR7046-1	6.9	0.0	10.5	29.1	1.070		W, Ob
BR7049-2	0.0	0.0	32.8	1.5	1.080	4	W, Ro
BR7070-3	3.2	0.0	5.3	2.1	1.077	4	W, L
BR7076-3	4.2	0.0	16.8	5.0	1.074	7	W, Ob
BR7083-1	0.0	0.0	0.0	28.4	1.080	7	W, Ob
BR7083-3	4.3	0.0	2.1	0.1	1.077	5	W, Ob, flat
BR7085-1	11.8	0.0	8.2	1.2	1.086	5	W, L
BR7093-12	1.2	0.0	10.5	2.3	1.074	4	W, Ro
BR7093-20	3.5	0.0	4.7	1.2	1.088	8	W, Ro
BR7093-22	4.8	9.7	8.1	0.0	1.089	7	W, Ro
BR7093-23	8.5	0.0	8.5	0.0	1.080	5	W, Ro
BR7103-7	37.2	0.0	13.9	0.0	1.081	5	W, Ob
B7136-1	5.6	0.0	19.7	0.0	1.073	6	W, Ro
B7143-1	1.6	0.0	3.2	1.6	1.083	8	R, Ro
B7143-12	5.8	0.0	0.0	1.9	1.068	10	R, Ro, DE
B7147-5	1.8	0.0	14.3	0.0	1.078	7	R, Ob
B7147-8	2.0	0.0	0.0	0.0	1.088	7	R, L
B7147-9	6.25	0.0	6.25	0.0	1.082	8	R, Ob
B7147-15	3.2	0.0	6.4	0.0	1.099	6	R, L
B7147-17	0.8	0.8	8.4	0.0	1.080	7	R, Ob, K
B7147-20	0.0	0.0	11.3	0.0	1.083		R, Ob
B7147-21	0.0	0.0	3.6	2.4	1.089	5	R, L
B7147-24	1.4	0.0	0.0	0.0	1.084	7	W, L, K
B7147-64	0.0	0.0	6.2	0.0	1.078	5	W, L
B7147-76	0.0	0.0	3.8	0.0	1.085	8	R, Ob, flat
B7147-83	0.0	0.0	23.8	0.0	1.084	8	R, Ob
B7147-90	0.0	0.0	3.7	7.4	1.079	7	R, Ob, flat
B7159-25	0.0	0.0	11.4	2.8	1.068	8	W, Ro
B7188-55	0.0	0.0	16.7	0.0	1.074	8	W, Ro
B7196-20	1.1	0.0	3.4	0.0	1.086	7	R, Ob, flat
B7196-23	0.0	0.0	18.9	0.0	1.065	8	R, Ob
B7196-37	0.0	0.0	0.0	0.0	1.084	5	R, L

¹Harvested August 26 and chipped August 31.

²R = russet, W = white, L = long, Ob = oblong, Ro = round, K = knobs, DE = Deep eyes.

WASHINGTON

N. Holstad, R. Kunkel and R. Holland

Results of the 1971 Potato Variety Trials

The objective this year was to determine the yield and quality potentials of a few selections which seemed promising for several years, either as fresh market or processing potatoes. This was done by planting and harvesting on different dates and by using different rates of fertilizer. As the growing season lengthened the rates of fertilization were increased as shown in the tables.

Three variety trials designed for August, October and November harvest dates were conducted near Othello, Washington. In addition, three fertilizer rate experiments with selection 168-3 were conducted. This selection is long, heavily russeted and the tubers are very attractive. It is above average in specific gravity and has made excellent uniform colored french fries. Seedpiece decay and decay in storage have been problems with this variety.

Triple sixteen fertilizer containing .4 % Disyston was banded, at planting, two inches to the side and slightly below the seedpiece. The Russet Burbank and Norgold seed were blue tag certified, the rest were grown in cooperation with the Washington State Department of Natural Resources at Bellingham, Washington. The rows were spaced 32 inches apart and the seed was spaced 8.2 inches apart within the rows. The plots were either two or four rows wide and 28.5 feet long.

The land was leveled for rill irrigation and was first planted to irrigated crops in 1961. Eptam at 1/2 gallon per acre was applied for weed control. Insects and diseases were controlled on a preventative basis with WSU recommended materials.

Variety Trial # 1. Ten varieties each at four fertilizer rates were grown 113 days. The seed was planted April 23, the vines were beaten off August 13 and the potatoes were harvested August 16-17. Specific gravity measurements were taken within seven days after harvest. Twenty tubers from each plot were cut for internal defects. Each variety was replicated five times. The results are in tables 1, 2 and 3.

Washington Table 1. Total yield for 113 days of growth.

Variety	Pounds/acre of N, P ₂ O ₅ and K ₂ O				Mean
	50	100	150	200	
A 503-42	378	532	627	496	508
A 6135-4	373	502	523	550	487
Cascade	360	552	450	473	459
A 63126-9	409	430	495	472	452
Norgold	424	451	434	483	448
W 44-3A	366	475	489	431	440
A 6305-8	352	436	428	452	417
A 6371-1	353	436	437	394	405
A 59197-5	300	383	443	416	386
A 6207-3	283	348	412	383	357
Mean	396	455	474	455	

Washington Table 2. Percent U.S. No. 1 potatoes for 113 days of growth.

Variety	Pounds/acre of N, P ₂ O ₅ and K ₂ O				Mean
	50	100	150	200	
A 503-42	90	94	94	92	93
A 6135-4	93	91	92	90	92
Cascade	84	89	84	92	87
A 63126-9	78	72	76	78	76
Norgold	85	86	89	91	88
W 44-3A	91	90	90	93	91
A 6305-8	82	82	85	87	84
A 6371-1	80	81	86	87	84
A 59197-5	71	83	82	83	80
A 6207-3	87	89	90	86	88
Mean	84	86	87	88	

Washington Table 3. Specific gravity (coded omitting 1.0) for 113 days of growth.

Variety	Pounds/acre of N, P ₂ O ₅ and K ₂ O				Mean
	50	100	150	200	
A 503-42	89	85	85	79	85
A 6135-4	79	77	78	70	76
Cascade	83	79	79	73	79
A 63126-9	88	88	84	79	85
Norgold	80	83	80	74	79
W 44-3A	84	84	85	79	83
A 6305-8	85	86	78	75	81
A 6371-1	85	82	81	80	82
A 59197-5	85	82	80	78	81
A 6207-3	81	76	78	72	77
Mean	84	82	81	76	

Variety Trial # 2. Eight varieties each at two fertilizer rates were grown for 138 days in a split plot experiment with six replications. The potatoes were planted on May 20. The vines were beaten off on October 4 and the plots harvested October 5-6. Specific gravity measurements were taken within seven days after harvest. The results are in tables 4, 5 and 6. Potato samples are in storage and will be tested for internal defects.

Washington Table 4. Total yield for 138 days of growth.

Variety	Pounds/acre of N, P ₂ O ₅ and K ₂ O		Mean
	180	260	
A 503-42	592	713	653
A 6135-4	527	527	527
A 63126-9	500	508	504
R. Burbank	480	485	483
A 6305-8	456	477	467
Norgold	459	473	466
W 44-3A	426	470	448
A 6207-3	432	428	430
Mean	484	510	

Washington Table 5. Percent U.S. No. 1 potatoes for 138 days of growth.

Variety	Pounds/acre of N, P ₂ O ₅ and K ₂ O		Mean
	180	260	
A 503-42	82	86	84
A 6135-4	79	82	81
A 63126-9	67	66	67
R. Burbank	42	45	44
A 6305-8	75	80	78
Norgold	69	76	73
W 44-3A	65	72	69
A 6207-3	71	72	72
Mean	69	72	

Washington Table 6. Specific gravity (coded omitting 1.0) for 138 days of growth.

Variety	Pounds/acre of N, P ₂ O ₅ and K ₂ O		Mean
	180	260	
A 503-42	82	69	76
A 6135-4	82	79	81
A 63126-9	78	85	82
R. Burbank	84	85	85
A 6305-8	83	84	84
Norgold	72	71	72
W 44-3A	82	83	83
A 6207-3	80	75	78
Mean	80	79	

Variety Trial # 3. Ten varieties were grown at two fertilizer rates for 162 days in a split plot experiment with six replications. The potatoes were planted on May 20 and the vines were killed by frost on October 28. The plots were harvested on November 8 and specific gravity measurements were made within seven days after harvest. The samples are being held in storage for evaluation of internal defects. The results are in tables 7, 8 and 9.

Washington Table 7. Total yield for 162 days of growth.

Variety	Pounds/acre of N, P ₂ O ₅ and K ₂ O		Mean
	250	350	
A 503-42	747	741	744
A 6135-4	721	661	691
Cascade	626	699	663
A 63126-9	638	626	632
R. Burbank	546	582	564
A 6305-8	543	543	543
W 44-3A	539	516	528
A 6207-3	494	517	506
A 59197-5	504	490	497
A 6334-17	463	500	482
Mean	582	588	

Washington Table 8. Percent U.S. No. 1 potatoes for 162 days of growth.

Variety	Pounds/acre of N, P ₂ O ₅ and K ₂ O		Mean
	250	350	
A 503-42	89	91	90
A 6135-4	90	86	88
Cascade	85	88	87
A 63126-9	73	65	69
R. Burbank	54	47	51
A 6305-8	83	79	81
W 44-3A	78	73	76
A 6207-3	80	69	75
A 59197-5	74	77	76
A 6334-17	80	74	77
Mean	79	75	

Washington Table 9. Specific gravity (coded omitting 1.0) for 162 days of growth.

Variety	Pounds/acre of N, P ₂ O ₅ and K ₂ O		
	250	350	Mean
A 503-42	88	80	84
A 6135-4	83	79	81
Cascade	77	78	78
A 63126-9	93	88	91
R. Burbank	90	90	90
A 6305-8	88	84	86
W 44-3A	90	84	87
A 6207-3	85	80	83
A 59197-5	90	85	88
A 6334-17	85	85	85
Mean	87	83	

Selection 168-3 Trial # 1. Selection 168-3 was grown on four fertilizer rates in a Latin Square design experiment with four rows, four columns and three strata for a total of 48, 4-row plots. Only the two center rows were harvested. The seed was planted on April 27, the vines were beaten off on August 18 and the potatoes were harvested on August 19. The specific gravity determinations were made on August 30. The results are in Table 10.

Washington Table 10. Results of the 168-3 Experiment # 1.

Pounds/acre of N, P ₂ O ₅ and K ₂ O	Total Yield cwt/acre	Yield 1's cwt/acre	Percent 1's	Specific Gravity
50	264	203	77	1.098
100	320	246	77	1.097
150	332	252	77	1.093
200	298	226	76	1.088
Mean	304	232	77	1.094

Selection 168-3 Trial # 2. This trial was the same as number one except the plots were two rows wide instead of four. The seed was planted on May 20, the vines beaten off on October 4 and the potatoes were harvested on October 6. Specific gravity determinations were made October 11 and the ten largest tubers from about a 35-pound sample were cut for hollow heart. The results are in Table 11.

Washington Table 11. Results of the 168-3 Experiment # 2.

Pounds/acre of N, P ₂ O ₅ and K ₂ O	Total Yield cwt/acre	Yield 1's cwt/acre	Percent 1's	Specific Gravity	Percent H. Heart
100	304	180	59	1.085	49
200	279	142	50	1.085	56
300	281	121	42	1.081	42
400	267	100	37	1.078	28
Mean	283	136	47	1.082	44

Selection 168-3 Trial # 3. The seed was planted May 26 and the vines were killed by frost on October 28. The experimental design was a Latin Square like Trial # 2. Only one plot of each fertilizer rate was harvested. All the tubers growth-cracked so badly that none would have passed for U.S. No. one grade.

West Virginia

R. J. Young ^{1/} and K. L. Deahl ^{2/}

Yield Trials

Early Yield Test. An early yield test was hand planted April 15 at Point Pleasant, West Virginia on the W.V.U. Ohio Valley Experiment Farm. Soils are generally light and warm up quickly permitting early planting. The test consisted of 16 entries in six replications. Rows were preformed using a one-row Iron Age planter. Fertilizer and disyston (15% granualr) were incorporated at rates of 200#N and 15# per acre respectively. Each replication contained 20 hills. Unfortunately, weather conditions at Point Pleasant turned cool and wet following planting. Germination, therefore, was delayed and irregular, presumably because of Rhizoctonia solani. Symptoms of apical pinching, aerial tubers and anthocyanescence in the terminal growth, evident throughout the growing season, attested to an early attack by Rhizoctonia. However, germination eventually was excellent. Vines were killed on August 23 and plots harvested on September 2. Unusually heavy rains delayed the intended harvest date. Results of this test are presented in West Virginia Table 1. Obviously, the prolonged growing season and poorly distributed periods of precipitation produced unusually heavy yields of large rough tubers. Despite these adverse conditions, several lines showed some promise for the Point Pleasant area: La Chipper, B5662-WV13, B5670-WV1, and B6140-WV1 produced acceptable yields and in general, the tuber type was acceptable also. Late yield tests were conducted W.V.U. Reedsville Experiment Farm and at Sommersville, West Virginia.

Reedsville Yield Test. This test was planted on May 5 using a one-Row Iron Age planter. The test contained 16 entries with six replicates. Fertilizer and Disyston (15% granular) were incorporated in a band at rates of 200#N and 15# per acre respectively. Except for several periods of unusually heavy precipitation, the growing season was considered average. Vines were killed September 9, and tubers harvested on September 29. The results of this test are presented in West Virginia Table 2.

Sommersville Yield Test. This late variety test was planted May 24, on the W.D. Amick farm located in Nicholas County, near Sommersville, West Virginia. Rows were preformed, with fertilizer and insecticide incorporated, using a two row planter with the covering disc removed. Seed peices were dropped by hand and a temporary hill formed with hand hoes. The entries were subsequently treated in the same manner as the commercial field. The growing season was considered average, however, late blight was present just prior to harvest. The results of this test are presented in West Virginia Table 3.

Late Blight

Multigenic Late Blight Test 1971. The blight test was conducted at Huttonsville, West Virginia. The plot was planted by hand on May 24, and consisted of

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four replications with each replication comprising four hills of each line. The experiment was designed so that approximately 1/5 of the foliage was susceptible to race-1,2,3,4 of Phytophthora infestans. By careful selection of the spreader foliage, for example, Kennebec (R-1), Sebago (R-0) and Katahdin (R-0), which vary with respect to field resistance, a continual release of inoculum throughout the test period was insured. Occasionally, the Huttonsville area is troubled by race-1,4 from nature. To avoid complete destruction of all inoculum source foliage 3Rc-8 (R-2), and Pentland Ace (R-3), were also planted in alternating rows, again to insure a continual release of inoculum through the test period. The plot was inoculated on July 15, with a zoospore-sporangial suspension of race-1,2,3,4 of P. infestans derived from inoculated tuber slices and Lima bean slants. The cultures were 8-10 days old. Environmental conditions were near optimal as a natural dew was forming and the air temperature at midnight was 55°F. Zoospore activity was moderate prior to inoculation. Only spreader rows were inoculated, this allowed the pathogen to produce many cycles and spread naturally to the test seedlings. For the next 5 days, ideal conditions prevailed so that by July 20, P. infestans was well established in the plot, shown by the presence of typical, sporulating lesions. By July 30, the disease had developed to the point that Irish Cobbler was 80 per cent defoliated and Kennebec and Katahdin were about 50 per cent defoliated. An initial evaluation was made August 4, with subsequent readings made on August 10 and September 1. The results of this test are presented in West Virginia Table 4. Isolations made from typical lesions were found to be race-1,2,3,4 when inoculated to host differentials. Each reading represented an average of four replications, comprising a total of 16 plants. The 1971 late blight test was considered severe when compared to previous years. Those lines demonstrating a 3+ reading or lower on September 1, carry a moderate-high level of multigenic resistance to P. infestans.

West Virginia Table 1. Yield of 16 early to medium-early varieties grown at Point Pleasant, West Virginia, 1971.

Variety or Pedigree	Yield expressed as CWT/A	
	US-1	Total
CHIPPEWA	236.3	265.3
DAZOC	285.1	333.3
I. COBBLER	302.3	384.1
KENNEBEC	436.3	393.4
LA CHIPPER	444.2	516.8
NORLAND	261.4	330.0
SUPERIOR	284.1	330.7
TAWA	272.6	330.7
B3682-WV1	181.5	258.7
B5422-9	374.9	424.4
B5662-WV4	109.6	139.3
B5662-WV13	238.3	250.8
B5670-WV1	233.0	268.0
B6039-WV1	351.8	446.2
B6140-WV1	347.8	390.1
B6657-WV2	394.7	478.5

West Virginia Table 2. Yield of 16 medium-late to late varieties grown at Reedsville, West Virginia, 1971.

Variety or Pedigree	Yield expressed at CWT/A	
	US-1	Total
KATAHDIN	157.0	186.0
ONA	176.6	281.5
B6086-WV21	225.5	313.5
B60280-WV6	134.0	167.5
B6039-WV2	140.5	181.5
B6039-WV6	168.5	215.0
B6649-WV1	110.0	149.0
B6652-WV1	180.5	232.5
B6653-WV7	108.5	149.5
B6655-WV1	183.5	233.0
B6657-WV2	186.	260.5
B6975-WV3	192.5	244.5
B6981-WV3	166.0	230.0
B6988-WV6	154.5	247.5
B6988-WV8	200.0	267.0
B6988-WV15	186.0	249.5

West Virginia Table 3. Yield of medium-late to late varieties grown at Sommersville, West Virginia, 1971

Variety or Pedigree	Yield expressed as CWT/A	
	US-1	Total
KATAHDIN	232	295.8
ONA	262	411.8
B6086-WV21	230.7	341.5
B6028-WV6	198.1	275.5
B6039-WV2	163.3	221.5
B6039-WV6	158.0	226.4
B6649-WV1	151.0	225.0
B6652-WV1	99.5	152.5
B6140-WV3	292.0	383.2
B6975-WV5	197.0	265.3
B6975-WV7	110.0	142.4
B6975-WV3	227.0	289.0
B6981-WV3	235.0	349.0
B6988-WV6	165.0	307.9
B6975-WV1	201.0	353.1
B6975-WV8	84.0	126.3

West Virginia Table 4. Summary of results for 1971 Multigenic Late Blight Test from Huttonsville, West Virginia

1971 Field #	Pedigree	8/4	Readings	
			8/10	9/1
1	CALROSE	2-*	2-	2
2	I. COBBLER	4	4+	5
3	KATAHDIN	3	4-	5
4	KENNEBEC	3	3	5-
5	PENCHIP	4-	3	4+
6	PENTLAND ACE	4-	5-	5
7	R. RURAL	3+	5-	5
8	SEBAGE	3	4-	5
9	3Rc-8	3+	4+	5
10	1563c-14	3+	4+	5
11	3XX-1	4-	4+	5
12	WV5-3	4-	5-	5
13	WV11-32	3+	4+	5
14	WV14-17	1+	0+	0
15	B3682-WV1	3	4-	5
16	BR5991-WV21	3-	3+	5-
17	B6038-WV3	2+	3-	5
18	B6039-WV1	3+	4	5
19	-WV2	2+	3	4+
20	-WV-6	2	2+	3-
21	-WV9	2	2+	4+
22	B6649-WV1	3	3	5
23	B6652-WV1	3-	3	4+
24	B6653-WV7	2+	2+	4-
25	B6655-WV1	3	3+	5-
26	B6657-WV2	4-	4	5-
27	B6928-WV2	1+	2-	3-
28	B6928-WV10	2+	4-	5
29	-WV14	2	2+	3+
30	B6935-WV2	3-	3	5-
31	B6949-WV2	3-	3-	4-
32	B6026-WV5	2	2	3-
33	B6960-WV2	2	2+	3-
34	-WV4	1+	1+	2-
35	-WV5	2+	2+	3
36	B6964-WV1	3	3	5-
37	WV2	3-	3	5
38	-WV3	2-	2-	2
39	B6975-WV2	2	2	2-
40	B6988-WV1	2+	3	5
41	-WV2	3-	3	5
42	-WV4	3	4	5-
43	-WV5	3+	3-	2+
44	-WV6	3	3	5-
45	-WV8	3	3+	5-
46	-WV9	3	4	5
47	-WV12	3	4+	5
48	-WV13	3-	2+	3+
49	-WV15	3-	2+	3
50	B6992A-WV9	3-	4-	5

51	B7023-WV1	3-	2+	4
52	-WV3	3+	4	5
53	-WV4	3+	3	4+
54	B6480-3	4-	5-	5
55	BR6486-1	3+	4+	5
56	BR6488-1	3-	3-	4
57	B6548-3	3-	4-	5
58	B6553-15	3+	4	5
59	B6679-6	2+	3	4+
60	B6692-1	3-	3+	5
61	B6695-1	3	4-	5
62	B6712-18	3+	4-	5
63	B6703-2	4-	5-	5
64	B6705-10	3+	4	5
65	B6705-12	4-	3+	4+
66	B6712-2	4-	4+	5
67	B6712-17	4-	4+	5
68	B6731-2	4	5-	5
69	B6741-23	3+	4-	5
70	B6750-7	3+	4-	5-
71	B6761-9	3+	2+	4
72	B6761-11	3-	2	4-
73	B6761-12	2+	2	3+
74	B6764-2	4	5-	5
75	B6774-6	3+	4+	5
76	B6775-4	3+	4+	5
77	B6782-1	3+	4-	5-
78	B6797-2	3	3+	5-
79	B6799-5	3+	5-	5
80	B6815-14	3-	3-	5
81	B6815-19	3	4-	5
82	BR6820-29	3+	4	5
83	BR6863-3	4-	4+	5
84	BR6863-7	4-	4	5
85	BR6864-9	3+	4	5
86	BR6871-5	3+	4+	5
87	BR6879-5	3	4+	5

* BLIGHT READINGS 0 - No Blight 5 Plant Dead
from Late Blight

WISCONSIN

P. R. Rowe and R. W. Ruhde

Genetics and Cytogenetics of the Tuber-Bearing Solanum Species
(Cooperative ARS, USDA and Wisconsin Station)

Frost tolerance

The 1971 field test for frost resistance included 56 clones that had been selected in 1970, and 69 seedling families (2594 seedlings). These clones and families have 2-6 frost-resistant diploid species in their pedigrees and some are second and third backcrosses to *Tuberosum*. The first killing frost occurred November 1st when the temperature was below freezing for 4.5 hours including 2 hours at 28° F.

The materials were planted July 20th in an effort to have actively growing plants at the time of the first frost. Nearly 30% of the seedling transplants were unthrifty and were removed during the first two months. Another 30% matured before the first frost. From the 1100 seedlings that were left at the time of the first frost, 152 were selected and dug. Twenty-five of the 56 clones selected in 1970, appeared to have good levels of frost resistance.

Next year the selected clones will be intercrossed, and the progenies will be screened for resistance to freezing temperatures and for tuber production.

Crossability of *S. stoloniferum*

Pollen tube growth following crosses of sto and 2x and 4x Tbr was studied. The results were similar to those obtained in 1970. In all sto-4x Tbr combinations, pollen tube growth was inhibited. Pollen tubes developed well following sto-2x Tbr combinations and self-pollination of sto and 4x Tbr. In an effort to see if this reaction could be influenced by heat treatment, styles were immersed in water at 50° C prior to pollination. This treatment had no influence on sto-Tbr crosses, but there was greater pollen tube development and increased seed set in the self-pollinated 2x Tbr.

Genetic markers

Progenies derived by selfing 24-chromosome hybrid clones were screened for segregation of the previously described marker genes, P, R, AC, B, I, and F and potentially useful new markers. The scoring was done both by visual inspection and analysis with thin-layer chromatography of flower and tuber skin pigments. A trait was found which controls the distribution of pigment to the ovary wall. This character appears to be inherited as a single dominant gene, and the symbol Ow has been assigned. In the plant material used in this study, Ow has linked with I and F. A major gene controlling tuber shape also appears to be associated with this linkage group.

A chemogenetic marker was detected in chromatograms. Under ultraviolet light, it appears as a bright fluorescent blue band very similar in appearance to chlorogenic acid, but with a lower Rf value in the same developing solvent. This band appears to be inherited as a single dominant gene.

Based on the information obtained from visual scoring and laboratory screening of progenies, the genotypes of 31 self-compatible clones were determined for several simply inherited characters. For example, upon analyzing the progeny obtained by selfing the clone US-W 8775-34 the genotype pp.RR.FF.II.owow.Acac could be assigned.

The genetics of split stigma have been studied further. Two recessive genes seem to control this character, but it is necessary for only one gene to be homozygous recessive for the stigma to be split. A gene governing what is now called pigmented heart has been found to be linked to the gene for ovary wall pigmentation.

Development of trisomics

Interspecific aneuploids. Seven interspecific multiple aneuploids from the crosses S. maglia x S. berthaultii, S. maglia x S. microdontum, and (S. tuberosum x S. berthaultii) x S. berthaultii were studied to determine their chromosome compliments and to assess their potential value. These clones grow vigorously in the field, but some were dwarf and compact in habit. Six of the seven clones were female fertile. At first metaphase, .5 to .7 trivalents were formed per extra chromosome. Chain and "Y" trivalents were found most frequently. Pachytene analysis of six of the multiple aneuploids indicated that in five of the clones, one or two of the extra chromosomes was an isochromosome. In the six multiple aneuploids, chromosomes II, III, IV, X, and XII and isochromosomes of I, III, and XI have been identified.

The F₁ progeny of interspecific aneuploids x marker gene stocks were planted in the spring of 1971. These progeny were scored for several different genetic markers and genotypes were assigned to the aneuploids for future genetic studies. Chromosome counts were made on selected genotypes among the F₁ progeny to detect aneuploids with a specific genotypic constitution that could be test crossed with genetic marker stocks. Some of these test-cross progeny are being examined for distorted genetic ratios in an attempt to associate the extra chromosome with a particular gene. The F₁ progeny were extremely vigorous, flowered and tuberized well, and probably are even more useful than the original parent clone because their genotypic constitution has been determined.

Intraspecific aneuploids. Seed obtained from 3x-2x crosses in S. chacoense, S. pinnatisectum and S. tarijense were planted in the spring. The chromosomes of 195 of these progeny were counted. Ninety-three percent of the progeny were aneuploids ($2n = 25 - 30$). Of these, 30% were trisomics. All aneuploids were grown in the field in Sturgeon Bay, and the trisomics were grown in the greenhouse in Madison as well. Morphological data were taken on the aneuploids, and preliminary results suggest that there may be a few distinctive characters which can be attributed to the presence of the extra chromosomes, e.g., fruit shape, corolla shape, and type. All clones were crossed with genetic marker stocks, and sufficient seed was obtained in two species (S. chacoense and S. tarijense). As expected, no seed was obtained from crosses with pnt. Markers will have to be found in this species before further genetic studies can be made. Many of the aneuploids were selfed, but only five clones showed any degree of self-compatibility. These will have to be tested further to distinguish between true and pseudocompatibility.

WYOMING

K. E. Bohnenblust

The Wyoming Potato Variety Trials were planted at the Agricultural Experiment Station farm at Laramie and the Agricultural Substations at Powell and Torrington.

All of the tests were hindered by poor stands. Cool weather when germination should have occurred may have been involved, however, it appeared more complex than that. In spite of poor stands some of the yields were relatively good.

At Torrington the highest total yield, 340 hundredweight per acre, was produced by the variety Red LaSoda. This is not unusual because it is well adapted to the Wyoming area and nearly always is at, or near, the top in yield. This year, however, was a good one for Russet Burbank, and the yield of that variety (339.7 hundredweight per acre) was essentially the same as Red LaSoda. The yields of Shurchip, Norchip and Viking were not statistically different than that of Red LaSoda. In yield of U. S. No. 1 potatoes, Norchip, Shurchip and Viking exceeded Red LaSoda.

The specific gravity of Jewell was the best at Torrington. The 1.088 of Jewell exceeded the 1.087 of Russet Burbank. Three other good chippers, Cascade, Norchip and Shurchip, all had a specific gravity reading of 1.085.

At Powell, Red LaSoda yielded 371.5 hundredweight per acre, which again made it the highest yielding variety. As at Torrington, Russet Burbank was second in yield but this time the yield of 326.7 hundredweight made a difference of 44.8 between the two varieties. The yields of Russet Burbank, Norchip and Viking were not statistically different than that of Red LaSoda. When U. S. No. 1 potatoes were considered, the 301.3 yield of Red LaSoda left that variety at the top. The yields of the next three varieties, Viking, Russet Burbank and Norchip, were within a range of five pounds.

The specific gravity of potatoes grown at Powell was generally lower than usual. Russet Burbank and Norchip did give excellent results with readings of 1.089 and 1.087, respectively.

Late emergence and poor stands resulted in low yields at Laramie. The highest yield was achieved with Viking and that was 164.9 hundredweight per acre. Superior, Chieftain, Red LaSoda and Norchip followed in that order and were not significantly different than Viking. In production of U. S. No. 1 tubers, Superior gave the highest yield of 149.4 hundredweight while Viking at 148.2 was practically equal to it.

The specific gravity of potatoes grown at Laramie was high. Jewell, at 1.106, was followed by Superior, at 1.105, and Russet Burbank, at 1.103.

Wyoming Table 1. Potato variety yield trial, Torrington, 1971^{1/}

Variety	Yield Per Acre			Rank of US No. 1	Specific Gravity
	Total	US No. 1			
	Cwt	Cwt	Pct		
Red LaSoda	340.0	289.2	85	4	1.081
Russet Burbank	339.7	259.7	76	5	1.087
Shurchip	331.5	294.6	89	2	1.085
Norchip	330.9	298.3	90	1	1.085
Viking	325.5	292.8	90	3	1.074
Chieftain	266.2	232.3	87	6	1.081
Norgold	250.5	223.9	89	8	1.083
La Rouge	244.4	224.5	92	7	1.080
Norland	231.1	217.2	94	9	1.071
Superior	230.5	200.9	87	10	1.082
Cascade	226.3	194.2	86	11	1.085
K X T	225.7	174.8	77	13	1.079
Wyred	220.8	193.6	88	12	1.075
Jewell	180.9	147.0	81	14	1.088
General Mean	247.9	227.0			
LSD .05	47.3				

^{1/}Date planted -- May 28.

Rows spaced 36 inches apart with hills 12 inches apart.

Planted in 1-row plots, 30 ft. long, in 4 randomized blocks.

Date of killing frost -- Sept. 17.

Date harvested -- Sept. 30.

Minimum size of US No. 1 tubers -- 1-7/8 inches.

Graded -- Nov. 5.

Specific gravity obtained -- Dec. 3, with potato hydrometer.

Previous crop -- alfalfa.

Fertilizer -- none.

Irrigation -- furrow.

Wyoming Table 2. Potato variety yield trial, Powell, 1971.^{1/}

Variety	Yield per acre			Rank of US No. 1	Specific Gravity
	Total	US No. 1			
	Cwt	Cwt	Pct		
Red LaSoda	371.5	301.3	81	1	1.079
Russet Burbank	326.7	257.7	79	3	1.089
Norchip	322.5	255.9	79	4	1.087
Viking	297.7	260.3	87	2	1.077
Cascade	254.1	174.2	69	5	1.076
LaRouge	205.1	165.2	81	7	1.082
Wyred	195.4	171.9	88	6	1.068
K X T	183.3	128.8	70	9	1.075
Norland	158.5	150.6	95	8	1.078
General Mean	250.5	208.9			
LSD .05	92.0				

^{1/} Date planted -- May 27.

Rows spaced 36 inches apart with hills 12 inches apart.

Planted in 1-row plots, 30 feet long, in 4 randomized blocks.

Date of killing frost -- Sept. 17.

Date harvested -- Oct. 7.

Minimum size of US No. 1 tubers -- 1-7/8 inches.

Graded -- Oct. 14.

Specific gravity obtained -- Dec. 9, with potato hydrometer.

Previous crop -- sugarbeets.

Fertilizer -- 100 lbs. N.

Irrigation -- furrow.

Wyoming Table 3. Potato variety yield trial, Laramie, 1971.^{1/}

Variety	Yield per acre			Rank of US No. 1	Specific Gravity
	Total	US No. 1			
	Cwt	Cwt	Pct		
Viking	164.9	148.2	90	2	1.090
Superior	160.6	149.4	93	1	1.105
Chieftain	156.5	141.3	90	3	1.090
Red LaSoda	123.8	103.2	87	6	1.088
Norchip	122.8	118.6	97	4	1.086
La Rouge	115.0	104.9	91	5	1.087
Cascade	111.3	96.2	86	7	1.094
Russet Burbank	108.9	93.2	86	9	1.103
Wyred	100.7	95.3	95	8	1.083
Shurchip	95.0	83.3	88	10	1.092
Norland	86.3	80.7	94	11	1.082
Norgold	75.3	68.4	91	12	1.096
Jewell	63.5	56.3	89	13	1.106
K X T	50.8	43.6	86	14	1.084
General Mean	108.9	98.8			
LSD .05	45.1				

^{1/} Date planted -- June 3.

Rows spaced 36 inches apart with hills 12 inches apart.

Planted in 1-row plots, 30 ft. long, in 4 randomized blocks.

Date of killing frost -- Sept. 15.

Date harvested -- Sept. 28.

Minimum size of US No. 1 tubers -- 1-7/8 inches.

Graded -- Nov. 23.

Specific gravity obtained -- Dec. 10, with potato hydrometer.

Previous crop -- alfalfa

Fertilizer -- 60 lbs. N.

Irrigation -- furrow.



